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MAY '41

SCIENCE-FICTION

A STREET & SMITH PUBLICATION

UNIVERSE

By ROBERT HEINLEIN

MAY • 1941

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ASTOUNDING

SCIENCE-FICTION

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All stories in this magazine are fiction. No actual persons are designated either by name or character. Any similarity is coincidental.

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HISTORY TO COME

FUNDAMENTALLY, science-fiction novels are "period pieces," historical novels laid against a background of a history that hasn't happened yet. The author of the more common type of historical novel, before he begins writing, spends hours, days or months—depending on his desire for reality of background—studying about the period to be discussed. He studies the manners of the times, the customs and the tools available, the means of travel and the social and economic conflicts in the life of a man of the time.

Frequently a study of the period leads directly to the story—the plot and action are logical outgrowths of the conflicts inherent in the times. The author of the historical novel has at hand not only the material relating to that immediate period, but has available information on the forces of social and economic and technical nature that produced it. Equally or perhaps more important, he knows what his characters can not—the ultimate outcome. He can see, and play up in his writing, the obscure trends of a selected era that carried hidden in them the seed of whole new histories to come. Hindsight on such things is so apt to be markedly more brilliant than the understanding of the time.

Now, basically, all those things should apply to science-fiction. True, the history hasn't happened yet—but that should mean simply that, instead of library research into the past, the author can do mental research into possible future. The idea is simple enough. The problem is to do an adequate, consistent, and interesting job on it.

On Pages 124 and 125 of this issue, Astounding carries a graphical extract from the Heinlein "History of Tomorrow." Robert Heinlein's stories have all been laid on that background, and, largely, are generated by it. Heinlein is a Grade A writer to begin with, but by giving himself the added help of a carefully worked out history, building up in his mind a picture of a world of tomorrow that's "lived in," his stories have achieved manifold greater reality—and done it a lot more easily.

The author that cooks up a special history of the future and a special world of the future for each story never attains a "lived-in" world. It's always, somehow, like an interior decorator's just-finished result. All the chairs and tables and ash trays are there, and the lamps are lighted—but it's a stage setting, and stiff as the binding of an unread book. It needs the rug pulled a little askew, and the ash trays with a few butts in them, the cushions rumbled—to be lived in and enjoyed.

One-story "histories" tend to be that way. The tall buildings and air cabs hang around on wires, and nobody leans out of the windows—and the author has to work just as hard for as little result in cooking up the next story's background.

I suggested to Heinlein that he let me print a part of his "History"—

and finally got a piece of the big chart he works from. Heinlein is an engineer—having been trained at Annapolis—and has studied and, more important, practiced politics, psychology, and a number of other useful lines of work. He was in a position to build up this history of things that might well be.

In the first column are the dates; in the second, the titles of stories told and stories yet untold. "Universe" in the present issue does not fall on this segment of the chart, though its beginnings are here. Regular Astounding readers will recognize the other stories and most of the characters who appear in the third column.

The vertical lines represent the life lines of the principal characters mentioned in the various stories. The overlapping of lifetimes means that, for instance, Harriman, who appeared in "Requiem," was alive and active during the struggle over atomic power plants told of in "Blowups Happen."

The third column of technological developments is extremely useful in laying out stories. It suggests the means and methods available to a character in, say, a story laid in 2118, the things he would use and things he would not use any longer.

The political-social organization of the time, represented in Column 6, is the fundamental necessity for understanding—and imagining—the reactions of individuals of the time. "If This Goes On—" and "Coventry" both derived directly from considerations of the situation expressed in Columns 6 and 7.

Column 7, while also related to political and social status, bears more on the trends, the long-term results based on things that may, at the time, seem of lesser import.

On Page 123 the stories which have been told are listed, together with a brief item that may recall each one, and the dates of their original publication. The order of their publication has not, of course, been remotely "chronological," in terms of their places in the Heinlein History. "Life-Line," the first published, is the first on the chart; "Misfit," the second published, is dated about 2105, while the third published, "Requiem," goes back to 1990.

As to the stories still to be told, I know as little about them as you—and I'm about as curious. I know he's working on "While The Evil Days Come Not," and plotting on a sequel to the current "Universe."

The Heinlein "History" starts with 1940. It might be of very real interest to you to trace in on this suggestion for the future your own life line. My own, I imagine, should extend up to about 1980—a bit beyond the time of "Roads Must Roll" and "Blowups Happen." My children may see the days of "The Logic of Empire."

Where does your life line fall? Where will your children's end?

THE EDITOR.



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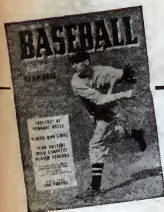
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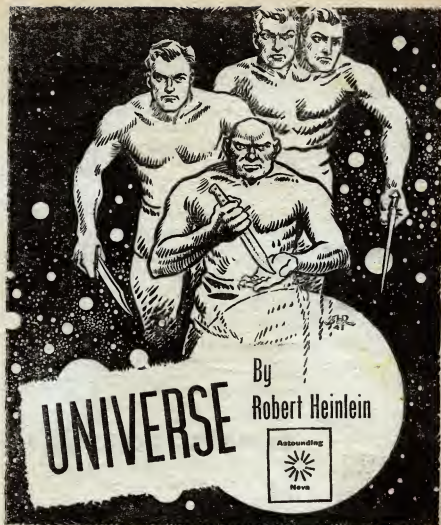
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Quoted from "The Romance of

Modern Astrography," by Franklin Buck, published by Lux Transcriptions, Ltd., 3.50 cr.

"THERE'S a mutie! Look out!"

At the shouted warning Hugh Hoyland ducked, with nothing to spare. An egg-sized iron missile

changed against the bulkhead just above his scalp with force that promised a fractured skull. The speed with which he crouched had lifted his feet from the floor plates. Before his body could settle slowly to the deck, he planted his feet against the bulkhead behind him and shoved. He went shooting down the passageway in a long, flat dive, his knife drawn and ready.

He twisted in the air, checked himself with his feet against the opposite bulkhead at the turn in the passage from which the mutie had attacked him, and floated lightly to his feet. The other branch of the passage was empty.

His two companions joined him, sliding awkwardly over the floor plates. "Is he gone?" demanded Alan Mahoney.

"Yes," agreed Hoyland. "I caught a glimpse of it as it ducked down that hatch. A female, I think. Looked like it had four legs."

"Two legs, or four, we'll never catch it now," commented the third man.

"Who the Huff wants to catch it?" protested Mahoney. "I don't."

"Well, I do, for one," said Hoyland. "By Jordan, if its aim had been two inches better, I'd be ready for the Converter."

"Can't either one of you two speak three words without swearing?" the third man disapproved. "What if the Captain could hear you?" He touched his forehead reverently as he mentioned the Captain.

"Oh, for Jordan's sake," snapped Hoyland, "don't be so stuffy, Mort Tyler. You're not a scientist yet. I reckon I'm as devout as you are—there's no grave sin in occasionally giving vent to your feelings. Even the scientists do it. I've heard 'em."

Tyler opened his mouth as if to

expostulate, then apparently thought better of it.

Mahoney touched Hoyland on the arm. "Look, Hugh," he pleaded, "let's get out of here. We've never been this high before. I'm jumpy—I want to get back down to where I can feel some weight on my feet."

Hoyland looked longingly toward the hatch through which his assailant had disappeared while his hand rested on the grip of his knife, then he turned to Mahoney. "O. K., kid," he agreed, "it's a long trip down anyhow."

He turned and slithered back toward the hatch whereby they had reached the level where they now were, the other two following him. Disregarding the ladder by which they had mounted he stepped off into the opening and floated slowly down to the deck fifteen feet below, Tyler and Mahoney close behind him. Another hatch, staggered a few feet from the first, gave access to a still lower deck. Down, down, down, and still farther down they dropped, tens and dozens of decks, each silent, dimly lighted, mysterious. Each time they fell a little faster, landed a little harder. Mahoney protested at last.

"Let's walk the rest of the way, Hugh. That last jump hurt my feet."

"All right. But it will take longer. How far have we got to go. Anybody keep count?"

"We've got about seventy decks to go to reach farm country," answered Tyler.

"How do you know?" demanded Mahoney suspiciously.

"I counted them, stupid. And as we came down I took one away for each deck."

"You did not. Nobody but a scientist can do numbering like that. Just because you're learning to read

and write you think you know everything."

Hoyland cut in before it could develop into a quarrel. "Shut up, Alan. Maybe he can do it. He's clever about such things. Anyhow it feels like about seventy decks—I'm heavy enough."

"Maybe he'd like to count the blades on my knife."

"Stow it, I said. Dueling is forbidden outside the village. That is the Rule." They proceeded in silence, running lightly down the stairways until increasing weight on each succeeding level forced them to a more pedestrian pace. Presently they broke through into a level that was quite brilliantly lighted and more than twice as deep between decks as the ones above it. The air was moist and warm; vegetation obscured the view.

"Well, down at last," said Hugh. "I don't recognize this farm; we must have come down by a different line than we went up."

"There's a farmer," said Tyler. He put his little fingers to his lips and whistled, then called, "Hey! Shipmate! Where are we?"

The peasant looked them over slowly, then directed them in reluctant monosyllables to the main passageway which would lead them back to their own village.

A BRISK WALK of a mile and a half down a wide tunnel moderately crowded with traffic—travelers, porters, an occasional pushcart, a dignified scientist swinging in a litter borne by four husky orderlies and preceded by his master at arms to clear the common crew out of the way—a mile and a half of this brought them to the common of their own village, a spacious compartment three decks high and perhaps ten times as wide. They split

up and went their own ways, Hugh to his quarters in the barracks of the cadets—young bachelors who did not live with their parents—washed himself, and went thence to the compartments of his uncle, for whom he worked for his meals. His aunt glanced up as he came in, but said nothing, as became a woman.

His uncle said, "Hello, Hugh. Been exploring again?"

"Good eating, uncle. Yes."

His uncle, a stolid sensible man, looked tolerantly amused. "Where did you go and what did you find?"

Hugh's aunt had slipped silently out of the compartment, and now returned with his supper which she placed before him. He fell to—it did not occur to him to thank her. He munched a bite before replying.

"Up. We climbed almost to the level-of-no-weight. A mutie tried to crack my skull."

His uncle chuckled. "You'll find your death in those passageways, lad. Better you should pay more attention to my business against the day when I'll die and get out of your way."

Hugh looked stubborn. "Don't you have any curiosity, uncle?"

"Me? Oh, I was prying enough when I was a lad. I followed the main passage all the way around and back to the village. Right through the Dark Sector I went, with muties tagging my heels. See that scar?"

Hugh glanced at it perfunctorily. He had seen it many times before and heard the story repeated to boredom. Once around the Ship—*psui!* He wanted to go everywhere, see everything, and find out the why of things. Those upper levels now—if men were not intended to climb that high, why had Jordan created them?

But he kept his own counsel and

went on with his meal. His uncle changed the subject. "I've occasion to visit the Witness. John Black claims I owe him three swine. Want to come along?"

"Why, no, I guess not— Wait—I believe I will."

"Hurry up, then."

THEY STOPPED at the cadets' barracks, Hugh claiming an errand. The Witness lived in a small, smelly compartment directly across the Common from the barracks, where he would be readily accessible to any who had need of his talents. They found him sitting in his doorway, picking his teeth with a fingernail. His apprentice, a pimply-faced adolescent with an intent nearsighted expression, squatted behind him.

"Good eating," said Hugh's uncle.

"Good eating to you, Edard Hoyland. D'you come on business, or to keep an old man company?"

"Both," Hugh's uncle returned diplomatically, then explained his errand.

"So?" said the Witness. "Well—the contract's clear enough:

"Black John delivered ten bushels of oats, Expecting his pay in a pair of shoats; Ed brought his sow to breed for pig; John gets his pay when the pigs grow big."

"How big are the pigs now, Edard Hoyland?"

"Big enough," acknowledged Hugh's uncle, "but Black claims three instead of two."

"Tell him to go soak his head. 'The Witness has spoken.'" He laughed in a thin, high cackle.

The two gossiped for a few minutes, Edard Hoyland digging into his recent experiences to satisfy the old man's insatiable liking for details. Hugh kept decently silent

while the older men talked. But when his uncle turned to go he spoke up. "I'll stay awhile, uncle."

"Eh? Suit yourself. Good eating, Witness."

"Good eating, Edard Hoyland."

"I've brought you a present, Witness," said Hugh, when his uncle had passed out of hearing.

"Let me see it."

Hugh produced a package of tobacco which he had picked up from his locker at the barracks. The Witness accepted it without acknowledgment, then tossed it to his apprentice, who took charge of it.

"Come inside," invited the Witness, then directed his speech to his apprentice. "Here, you—fetch the cadet a chair."

"Now, lad," he added as they sat themselves down, "tell me what you have been doing with yourself."

Hugh told him, and was required to repeat in detail all the incidents of his more recent explorations, the Witness complaining the meanwhile over his inability to remember exactly everything he saw.

"You youngsters have no capacity," he pronounced. "No capacity. Even that lout"—he jerked his head toward the apprentice—"he has none, though he's a dozen times better than you. Would you believe it, he can't soak up a thousand lines a day, yet he expects to sit in my seat when I am gone. Why, when I was apprenticed, I used to sing myself to sleep on a mere thousand lines. Leaky vessels—that's what you are."

HUGH did not dispute the charge, but waited for the old man to go on; which he did in his own time.

"You had a question to put to me, lad?"

"In a way, Witness."

"Well—out with it. Don't chew your tongue."

"Did you ever climb all the way up to no-weight?"

"Me? Of course not. I was a Witness, learning my calling. I had the lines of all the Witnesses before me to learn, and no time for boyish amusements."

"I had hoped you could tell me what I would find there."

"Well, now, that's another matter. I've never climbed, but I hold the memories of more climbers than you will ever see. I'm an old man. I knew your father's father, and his grandsire before that. What is it you want to know?"

"Well—" What was it he wanted to know? How could he ask a question that was no more than a gnawing ache in his breast. Still—"What is it all for, Witness? Why are there all those levels above us?"

"Eh? How's that? Jordan's name, son—I'm a Witness, not a scientist."

"Well—I thought you must know. I'm sorry."

"But I do know. What you want is the Lines from the Beginning."

"I've heard them."

"Hear them again. All your answers are in there, if you've the wisdom to see them. Attend me. No—this is a chance for my apprentice to show off his learning. Here, you! The Lines from the Beginning—and mind your rhythm."

The apprentice wet his lips with his tongue and began:

"In the Beginning there was Jordan, thinking His lonely thoughts alone.

In the Beginning there was darkness, formless, dead, and Man unknown.

Out of the loneliness came a longing, out of the longing came a vision,

Out of the dream there came a planning, out of the plan there came decision—

Jordan's hand was lifted and the Ship was born!

"Mile after mile of snug compartments; tank by tank for the golden corn,

Ladder and passage, door and locker, fit for the needs of the yet unborn.

He looked on His work and found it pleasing, meet for a race that was yet to be.

He thought of Man—Man came into being—checked his thought and searched for the key.

Man untamed would shame his Maker, Man unrul'd would spoil the Plan;

So Jordan made the Regulations, orders to each single man,

Each to a task and each to a station, serving a purpose beyond their ken,

Some to speak and some to listen—order came to the ranks of men.

Crew He created to work at their stations, scientists choose to guide the Plan.

Over them all He created the Captain, made him judge of the race of Man.

Thus it was in the Golden Age!

Jordan is perfect, all below him lack perfection in their deeds.

Envy, Greed and Pride of Spirit sought for minds to lodge their seeds.

One there was who gave them lodging—accursed Huff, the first to sin!

His evil counsel stirred rebellion, planted doubt where it had not been;

Blood of martyrs stained the floor plates, Jordan's Captain made the Trip.

Darkness swallowed up—"

The old man gave the boy the back of his hand, sharp across the mouth. "Try again!"

"From the beginning?"

"No! From where you missed."

The boy hesitated, then caught his stride:

"Darkness swallowed ways of virtue, Sin prevailed throughout the Ship—"

The boy's voice droned on, stanza after stanza, reciting at great length but with little sharpness of detail the old, old story of sin, rebellion, and the time of darkness. How wisdom prevailed at last and the bodies of the rebel leaders were fed to the Converter. How some of the rebels escaped making the Trip and lived to father the muties. How a

new Captain was chosen, after prayer and sacrifice.

Hugh stirred uneasily, shuffling his feet. No doubt the answers to his questions were there, since these were the Sacred Lines, but he had not the wit to understand them. Why? What was it all about? Was there really nothing more to life than eating and sleeping and finally the long Trip? Didn't Jordan intend for him to understand? Then why this ache in his breast? This hunger that persisted in spite of good eating?

WHILE he was breaking his fast after sleep an orderly came to the door of his uncle's compartments. "The scientist requires the presence of Hugh Hoyland," he recited glibly.

Hugh knew that the scientist referred to was Lieutenant Nelson, in charge of the spiritual and physical welfare of the Ship's sector which included Hugh's native village. He bolted the last of his breakfast and hurried after the messenger.

"Cadet Hoyland!" he was announced. The scientist looked up from his own meal and said:

"Oh, yes. Come in, my boy. Sit down. Have you eaten?"

Hugh acknowledged that he had, but his eyes rested with interest on the fancy fruit in front of his superior. Nelson followed his glance. "Try some of these figs. They're a new mutation—I had them brought all the way from the far side. Go ahead—a man your age always has somewhere to stow a few more bites."

Hugh accepted with much self-consciousness. Never before had he eaten in the presence of a scientist. The elder leaned back in his chair, wiped his fingers on his shirt, arranged his beard, and started in.

"I haven't seen you lately, son. Tell me what you have been doing with yourself." Before Hugh could reply he went on, "No, don't tell me—I will tell you. For one thing you have been exploring, climbing, without too much respect for the forbidden areas. Is it not so?" He held the young man's eye. Hugh fumbled for a reply.

But he was let off again. "Never mind. I know, and you know that I know. I am not too displeased. But it has brought it forcibly to my attention that it is time that you decided what you are to do with your life. Have you any plans?"

"Well—no definite ones, sir."

"How about that girl, Edris Baxter? D'you intend to marry her?"

"Why . . . uh . . . I don't know, sir. I guess I want to, and her father is willing, I think. Only—"

"Only what?"

"Well—he wants me to apprentice to his farm. I suppose it's a good idea. His farm together with my uncle's business would make a good property."

"But you're not sure?"

"Well—I don't know."

"Correct. You're not for that. I have other plans. Tell me, have you ever wondered why I taught you to read and write? Of course, you have. But you've kept your own counsel. That is good.

"Now attend me. I've watched you since you were a small child. You have more imagination than the common run, more curiosity, more go. And you are a born leader. You were different even as a baby. Your head was too large for one thing, and there were some who voted at your birth inspection to put you at once into the Converter. But I held them off. I wanted to see how you would turn out.

"A peasant life is not for the likes of you. You are to be a scientist."

The old man paused and studied his face. Hugh was confused, speechless. Nelson went on, "Oh, yes. Yes, indeed. For a man of your temperament, there are only two things to do with him: Make him one of the custodians, or send him to the Converter."

"Do you mean, sir, that I have nothing to say about it?"

"If you want to put it that bluntly—yes. To leave the bright ones among the ranks of the Crew is to breed heresy. We can't have that. We had it once and it almost destroyed the human race. You have marked yourself out by your exceptional ability; you must now be instructed in right thinking, be initiated into the mysteries, in order that you may be a conserving force rather than a focus of infection and a source of trouble."

The orderly reappeared loaded down with bundles which he dumped on the deck. Hugh glanced at them, then burst out, "Why, those are my things!"

"Certainly," acknowledged Nelson, "I sent for them. You're to sleep here henceforth. I'll see you later and start you on your studies—unless you have something more on your mind?"

"Why, no, sir, I guess not. I must admit I am a little confused. I suppose . . . I suppose this means you don't want me to marry?"

"Oh, *that*," Nelson answered indifferently. "Take her if you like—her father can't protest now. But let me warn you you'll grow tired of her."

HUGH HOYLAND devoured the ancient books that his mentor permitted him to read, and felt no desire for many, many sleeps to go climb-



ing, or even to stir out of Nelson's cabin. More than once he felt that he was on the track of the secret—a secret as yet undefined, even as a question—but again he would find himself more confused than ever. It was evidently harder to reach the wisdom of scientishood than he had thought.

Once, while he was worrying away at the curious twisted characters of the ancients and trying to puzzle out their odd rhetoric and unfamiliar terms, Nelson came into the little compartment that had been set aside for him, and, laying a fatherly hand

on his shoulder, asked, "How goes it, boy?"

"Why, well enough, sir, I suppose," he answered, laying the book aside. "Some of it is not quite clear to me—not clear at all, to tell the truth."

"That is to be expected," the old man said equably. "I've let you struggle along by yourself at first in order that you may see the traps that native wit alone will fall into. Many of these things are not to be understood without instruction. What have you there?" He picked up the book and glanced at it. It was inscribed "Basic Modern Physics." So? This is one of the most valuable of the sacred writings, yet the uninitiate could not possibly make good use of it without help. The first thing that you must understand, my boy, is that our forefathers, for all their spiritual perfection, did not look at things in the fashion in which we do.

"They were incurable romantics, rather than rationalists, as we are, and the truths which they handed down to us, though strictly true, were frequently clothed in allegorical language. For example, have you come to the Law of Gravitation?"

"I read about it."

"Did you understand it? No, I can see that you didn't."

"Well," said Hugh defensively, "it didn't seem to *mean* anything. It just sounded silly, if you will pardon me, sir."

"That illustrates my point. You were thinking of it in literal terms, like the laws governing electrical devices found elsewhere in this same book. 'Two bodies attract each other directly as the product of their masses and inversely as the square of their distance.' It sounds like a rule for simple physical facts, does it not? Yet it is nothing of the sort;

it was the poetical way the old ones had of expressing the rule of proximity which governs the emotion of love. The bodies referred to are human bodies, mass is their capacity for love. Young people have a greater capacity for love than the elderly; when they are thrown together, they fall in love, yet when they are separated they soon get over it. 'Out of sight, out of mind.' It's as simple as that. But you were seeking some deep meaning for it."

Hugh grinned. "I never thought of looking at it that way. I can see that I am going to need a lot of help."

"Is there anything else bothering you just now?"

"Well, yes, lots of things, though I probably can't remember them off-hand. I mind one thing: Tell me, father, can muties be considered as being people?"

"I can see you have been listening to idle talk. The answer to that is both yes and no. It is true that the muties originally descended from people but they are no longer part of the Crew—they cannot now be considered as members of the human race, for they have flouted Jordan's Law.

"This is a broad subject," he went on, settling down to it. "There is even some question as to the original meaning of the word 'mutie.' Certainly they number among their ancestors the mutineers who escaped death at the time of the rebellion. But they also have in their blood the blood of many of the mutants who were born during the dark age. You understand, of course, that during that period our present wise rule of inspecting each infant for the mark of sin and returning to the Converter any who are found to be mutations was not in force. There are strange and horrible things crawl-

ing through the dark passageways and lurking in the deserted levels."

HUGH THOUGHT about it for a while, then asked, "Why is it that mutations still show up among us, the people?"

"That is simple. The seed of sin is still in us. From time to time it still shows up, incarnate. In destroying those monsters we help to cleanse the stock and thereby bring closer the culmination of Jordan's Plan, the end of the Trip at our heavenly home, far Centaurus."

Hoyland's brow wrinkled again. "That is another thing that I don't understand. Many of these ancient writings speak of the Trip as if it were an actual *moving*, a going-somewhere—as if the Ship itself were no more than a pushcart. How can that be?"

Nelson chuckled. "How can it, indeed? How can that move which is the background against which all else moves? The answer, of course, is plain. You have again mistaken allegorical language for the ordinary usage of everyday speech. Of course, the Ship is solid, immovable, in a physical sense. How can the whole universe move? Yet, it *does* move, in a spiritual sense. With every righteous act we move closer to the sublime destination of Jordan's plan."

Hugh nodded. "I think I see."

"Of course, it is conceivable that Jordan could have fashioned the world in some other shape than the Ship, had it suited his purpose. When man was younger and more poetical, holy men vied with one another in inventing fanciful worlds which Jordan might have created. One school invented an entire mythology of a topsy-turvy world of endless reaches of space, empty save for pin points of light and bodyless

mythological monsters. They called it the heavenly world, or heaven, as if to contrast it with the solid reality of the Ship. They seemed never to tire of speculating about it, inventing details for it, and of making pictures of what they conceived it to be like. I suppose they did it to the greater glory of Jordan, and who is to say that He found their dreams unacceptable? But in this modern age we have more serious work to do."

Hugh was not interested in astronomy. Even his untutored mind had been able to see in its wild extravagance an intention not literal. He returned to problems nearer at hand. "Since the muties are the seed of sin, why do we make no effort to wipe them out? Would not that be an act that would speed the Plan?"

The old man considered a while before replying, "That is a fair question and deserves a straight answer. Since you are to be a scientist you will need to know the answer. Look at it this way: There is a definite limit to the number of Crew the Ship can support. If our numbers increase without limit, there comes a time when there will not be good eating for all of us. Is it not better that some should die in brushes with the muties than that we should grow in numbers until we killed each other for food?"

"The ways of Jordan are inscrutable. Even the muties have a part in his Plan."

It seemed reasonable, but Hugh was not sure.

BUT WHEN Hugh was transferred to active work as a junior scientist in the operation of the Ship's functions, he found there were other opinions. As was customary, he put in a period serving the Converter.

The work was not onerous, he had principally to check in the waste materials brought in by porters from each of the villages, keep books on their contributions, and make sure that no reclaimable metal was introduced into the first-stage hopper. But it brought him into contact with Bill Ertz, the assistant chief engineer, a man not much older than himself.

He discussed with him the things he had learned from Nelson, and was shocked at Ertz's attitude.

"Get this through your head, kid," Ertz told him. "This is a practical job for practical men. Forget all that romantic nonsense. Jordan's Plan! That stuff is all right to keep the peasants quiet and in their place, but don't fall for it yourself. There is no Plan—other than our own plans for looking out for ourselves. The Ship has to have light and heat and power for cooking and irrigation. The Crew can't get along without those things and that makes us boss of the Crew.

"As for this soft-headed tolerance toward the muties, you're going to see some changes made! Keep your mouth shut and string along with us."

It impressed on him that he was expected to maintain a primary loyalty to the bloc of younger men among the scientists. They were a well-knit organization within an organization and were made up of practical, hard-headed men who were working toward improvement of conditions throughout the Ship, as they saw them. They were well-knit because an apprentice who failed to see things their way did not last long. Either he failed to measure up and soon found himself back in the ranks of the peasants, or, as was more likely, suffered some mishap and wound up in the Converter.

And Hoyland began to see that they were right.

They were realists. The Ship was the Ship. It was a fact, requiring no explanation. As for Jordan—who had ever seen Him, spoken to Him? What was this nebulous Plan of his? The object of life was living. A man was born, lived his life, and then went to the Converter. It was as simple as that, no mystery to it, no sublime Trip and no Centaurus. These romantic stories were simply hangovers from the childhood of the race before men gained the understanding and the courage to look facts in the face.

He ceased bothering his head about astronomy and mystical physics and all the other mass of mythology he had been taught to revere. He was still amused, more or less, by the Lines from the Beginning and by all the old stories about Earth—what the Huff was "Earth," anyhow?—but now realized that such things could be taken seriously only by children and dullards.

Besides, there was work to do. The younger men, while still maintaining the nominal authority of their elders, had plans of their own, the first of which was a systematic extermination of the muties. Beyond that, their intentions were still fluid, but they contemplated making full use of the resources of the Ship, including the upper levels. The young men were able to move ahead with their plans without an open breach with their elders because the older scientists simply did not bother to any great extent with the routine of the Ship. The present Captain had grown so fat that he rarely stirred from his cabin; his aide, one of the young men's bloc, attended to affairs for him.

Hoyland never laid eyes on the Chief Engineer save once, when he

showed up for the purely religious ceremony of manning landing stations.

The project of cleaning out the muties required reconnaissance of the upper levels to be done systematically. It was in carrying out such scouting that Hugh Hoyland was again ambushed by a mutie.

This mutie was more accurate with his slingshot. Hoyland's companion, forced to retreat by superior numbers, left him for dead.

JOE-JIM GREGORY was playing himself a game of checkers. Time was when they had played cards together, but Joe, the head on the right, had suspected Jim, the left-hand member of the team, of cheating. They had quarreled about it, then given it up, for they had both learned early in their joint career that two heads on one pair of shoulders must necessarily find ways of getting along together.

Checkers was better. They could both see the board, and disagreement was impossible.

A loud metallic knocking at the door of the compartment interrupted the game. Joe-Jim unsheathed his throwing knife and cradled it, ready for quick use. "Come in!" roared Jim.

The door opened, the one who had knocked backed into the room—the only safe way, as everyone knew, to enter Joe-Jim's presence. The newcomer was squat and ruggedly powerful, not over four feet in height. The relaxed body of a man hung across one shoulder and was steadied by a hand.

Joe-Jim returned the knife to its sheath. "Put it down, Bobo," Jim ordered.

"—And close the door," added Joe. "Now what have we got here?"

It was a young man, apparently

dead, though no wound appeared on him. Bobo patted a thigh. "Eat 'im?" he said hopefully. Saliva spilled out of his still-opened lips.

"Maybe," temporized Jim. "Did you kill him?"

Bobo shook his undersized head.

"Good Bobo," Joe approved.

"Where did you hit him?"

"Bobo hit him *there*." The microcephalic shoved a broad thumb against the supine figure in the area between the umbilicus and the breast bone.

"Good shot," Joe approved. "We couldn't have done better with a knife."

"Bobo good shot," the dwarf agreed blandly. "Want see?" He twitched his slingshot invitingly.

"Shut up," answered Joe, not unkindly. "No, we don't want to see; we want to make him talk."

"Bobo fix," the short one agreed, and started with simple brutality to carry out his purpose.

Joe-Jim slapped him away, and applied other methods, painful but considerably less drastic than those of the dwarf. The young man jerked and opened his eyes.

"Eat 'im?" repeated Bobo.

"No," said Joe. "When did you eat last?" inquired Jim.

Bobo shook his head and rubbed his stomach, indicating with graphic pantomime that it had been a long time—too long. Joe-Jim went over to a locker, opened it, and withdrew a haunch of meat. He held it up, Jim smelled it and Joe drew his head away in nose-wrinkling disgust. Joe-Jim threw it to Bobo, who snatched it happily out of the air. "Now, get out," ordered Jim.

BOBO trotted away, closing the door behind him. Joe-Jim turned to the captive and prodded him with his foot. "Speak up," said Jim.

"Who the Huff are you?"

The young man shivered, put a hand to his head, then seemed suddenly to bring his surroundings into focus, for he scrambled to his feet, moving awkwardly against the low weight conditions of this level, and reached for his knife.

It was not at his belt.

Joe-Jim had his own out and brandished it. "Be good and you won't get hurt. What do they call you?"

The young man wet his lips, and his eyes hurried about the room. "Speak up," said Joe.

"Why bother with him?" inquired Jim. "I'd say he was only good for meat. Better call Bobo back."

"No hurry about that," Joe answered, "I want to talk to him. What's your name?"

The prisoner looked again at the knife and muttered, "Hugh Hoyland."

"That doesn't tell us much," Jim commented. "What d'you do? What village do you come from? And what were you doing in mutie country?"

But this time Hoyland was sullen. Even the prick of the knife against his ribs caused him only to bite his lip. "Shucks," said Joe, "he's only a stupid peasant. Let's drop it."

"Shall we finish him off?"

"No. Not now. Shut him up."

Joe-Jim opened the door of a small side compartment, and urged Hugh in with the knife. He then closed and fastened the door and went back to his game. "Your move, Jim."

The compartment in which Hugh was locked was dark. He soon satisfied himself by touch that the smooth steel walls were entirely featureless save for the solid, securely fastened door. Presently he lay down on the deck and gave himself up to fruitless thinking.

He had plenty of time to think, time to fall asleep and awaken more than once. And time to grow very hungry and very, very thirsty.

When Joe-Jim next took sufficient interest in his prisoner to open the door of the cell, Hoyland was not immediately in evidence. He had planned many times what he would do when the door opened and his chance came, but when the event arrived, he was too weak, semicomatose. Joe-Jim dragged him out.

The disturbance roused him to partial comprehension. He sat up and stared around him.

"Ready to talk?" asked Jim.

Hoyland opened his mouth but no words came out.

"Can't you see he's too dry to talk?" Joe told his twin. Then to Hugh, "Will you talk if we give you some water?"

Hoyland looked puzzled, then nodded vigorously.

Joe-Jim returned in a moment with a mug of water. Hugh drank greedily, paused, and seemed about to faint.

Joe-Jim took the mug from him. "That's enough for now," said Joe. "Tell us about yourself."

Hugh did so. In detail, being prompted from time to time.

HUGH ACCEPTED A *de facto* condition of slavery with no particular resistance and no great disturbance of soul. The word "slave" was not in his vocabulary, but the condition was a commonplace in everything he had ever known. There had always been those who gave orders and those who carried them out—he could imagine no other condition, no other type of social organization. It was a fact of nature.

Though naturally he thought of escape.

Thinking about it was as far as he

got. Joe-Jim guessed his thoughts and brought the matter out into the open. Joe told him, "Don't go getting ideas, youngster. Without a knife you wouldn't get three levels away in this part of the Ship. If you managed to steal a knife from me, you still wouldn't make it down to high-weight. Besides, there's Bobo."

Hugh waited a moment, as was fitting, then said, "Bobo?"

Jim grinned and replied, "We told Bobo that you were his to butcher, if he liked, if you ever stuck your head out of our compartments without us. Now he sleeps outside the door and spends a lot of his time there."

"It was only fair," put in Joe. "He was disappointed when we decided to keep you."

"Say," suggested Jim, turning his head toward his brother's, "How about some fun?" He turned back to Hugh. "Can you throw a knife?"

"Of course," Hugh answered.

"Let's see you. Here." Joe-Jim handed him their own knife. Hugh accepted it, jiggling it in his hand to try its balance. "Try my mark."

Joe-Jim had a plastic target set up at the far end of the room from his favorite chair, on which he was wont to practice his own skill. Hugh eyed it, and, with an arm motion too fast to follow, let fly. He used the economical underhand stroke, thumb on the blade, fingers together.

The blade shivered in the target, well centered in the chewed-up area which marked Joe-Jim's best efforts.

"Good boy!" Joe approved. "What do you have in mind, Jim?"

"Let's give him the knife and see how far he gets."

"No," said Joe, "I don't agree."

"Why not?"

"If Bobo wins, we're out one serv-

ant. If Hugh wins, we lose both Bobo and him. It's wasteful."

"Oh, well—if you insist."

"I do. Hugh, fetch the knife."

Hugh did so. It had not occurred to him to turn the knife against Joe-Jim. The master was the master. For servant to attack master was not simply repugnant to good morals, it was an idea so wild that it did not occur to him at all.

HUGH had expected that Joe-Jim would be impressed by his learning as a scientist. It did not work out that way. Joe-Jim, especially Jim, loved to argue. They sucked Hugh dry in short order and figuratively cast him aside. Hoyland felt humiliated. After all, was he not a scientist? Could he not read and write?

"Shut up," Jim told him. "Reading is simple. I could do it before your father was born. D'you think you're the first scientist that has served me? Scientists—bah! A pack of ignoramuses!"

In an attempt to re-establish his own intellectual conceit, Hugh expounded the theories of the younger scientists, the strictly matter-of-fact, hard-boiled realism which rejected all religious interpretation and took the Ship as it was. He confidently expected Joe-Jim to approve such a point of view, it seemed to fit their temperaments.

They laughed in his face.

"Honest," Jim insisted, when he had ceased snorting, "are you young punks so stupid as all that? Why, you're worse than your elders."

"But you just got through saying," Hugh protested in hurt tones, "that all our accepted religious notions are so much bunk. That is just what my friends think. They want to junk all that old nonsense."

Joe started to speak; Jim cut in

ahead of him. "Why bother with him, Joe? He's hopeless."

"No, he's not. I'm enjoying this. He's the first one I've talked with in I don't know how long who stood any chance at all of seeing the truth. Let us be—I want to see whether that's a head he has on his shoulders, or just a place to hang his ears."

"O. K.," Jim agreed, "but keep it quiet. I'm going to take a nap." The left-hand head closed its eyes, soon it was snoring. Joe and Hugh continued their discussion in whispers.

"The trouble with you youngsters," he said, "is that if you can't understand a thing right off, you think it can't be true. The trouble with your elders is anything they didn't understand they re-interpreted to mean something else and then thought they understood it. None of you has tried believing clear words the way they were written and then tried to understand them on that basis. Oh, no, you're all too bloody smart for that—if you can't see it right off, it ain't so—it must mean something different."

"What do you mean?" Hugh asked suspiciously.

"Well, take the Trip, for instance. What does it mean to you?"

"Well—to my mind, it doesn't mean anything. It's just a piece of nonsense to impress the peasants."

"And what is the accepted meaning?"

"Well—it's where you go when you die—or rather what you do. You make the Trip to Centaurus."

"And what is Centaurus?"

"It's—mind you, I'm just telling you the orthodox answers; I don't really believe this stuff—it's where you arrive when you've made the Trip, a place where everybody's happy and there's always good eating."

Joe snorted. Jim broke the rhythm of his snoring, opened one eye, and settled back again with a grunt. "That's just what I mean," Joe went on in a lower whisper. "You don't use your head. Did it ever occur to you that the Trip was just what the old books said it was—the Ship and all the Crew actually going somewhere, moving?"

Hoyland thought about it. "You don't mean for me to take you seriously. Physically, it's an impossibility. The Ship can't go anywhere. It already is everywhere. We can make a trip through it, but *the* Trip—that has to have a spiritual meaning, if it has any."

Joe called on Jordan to support him. "Now, listen," he said, "get this through that thick head of yours. Imagine a place a lot bigger than the Ship, a lot bigger, with the Ship inside it—*moving*. D'you get it?"

Hugh tried. He tried very hard. He shook his head. "It doesn't make sense," he said. "There can't be anything bigger than the Ship. There wouldn't be any place for it to be."

"Oh, for Huff's sake. Listen—*Outside* the Ship, get that? Straight down beyond the lowest level in every direction. Emptiness out there. Understand me?"

"But there isn't anything below the lowest level. That's why it's the lowest level."

"Look. If you took a knife and started digging a hole in the floor of the lowest level, where would it get you?"

"But you *can't*. It's too hard."

"But suppose you did and it made a hole. Where would that hole go? Imagine it."

Hugh shut his eyes and tried to imagine digging a hole in the lowest level. Digging—as if it were soft—soft as cheese.

He began to get some glimmering of a possibility, a possibility that was unsettling, soul shaking. He was falling, falling into a hole that he had dug which had no levels under it. He opened his eyes very quickly. "That's awful!" he ejaculated. "I won't believe it."

Joe-Jim got up. "I'll *make* you believe it," he said grimly, "if I have to break your neck to do it." He strode over to the outer door and opened it. "Bobo!" he shouted. "Bobo!"

Jim's head snapped erect. "Wassa matter? Wha's going on?"

"We're going to take Hugh to no-weight."

"What for?"

"To pound some sense into his silly head."

"Some other time."

"No, I want to do it now."

"All right, all right. No need to shout. I'm awake now, anyhow."

JOE-JIM GREGORY was almost as nearly unique in his, or their, mental ability as he was in his bodily construction. Under any circumstances he would have been a dominant personality; among the muties it was inevitable that he should bully them, order them about, and live on their services. Had he had the will-to-power, it is conceivable that he could have organized the muties to fight and overcome the Crew proper:

But he lacked that drive. He was by native temperament an intellectual, a bystander, an observer. He was interested in the "how" and the "why," but his will to action was satisfied with comfort and convenience alone.

Had he been born two normal twins and among the Crew, it is likely that he would have drifted into scientishood as the easiest and most satisfactory answer to the

problem of living and as such would have entertained himself mildly with conversation and administration. As it was, he lacked mental companionship and had whiled away three generations reading and re-reading books stolen for him by his stooges.

The two halves of his dual person had argued and discussed what they read, and had almost inevitably arrived at a reasonably coherent theory of history and the physical world—except in one respect, the concept of fiction was entirely foreign to them; they treated the novels that had been provided for the Jordan expedition in exactly the same fashion that they did text and reference books.

This led to their one major difference of opinion. Jim regarded Allan Quartermain as the greatest man who had ever lived; Joe held out for John Henry.

They were both inordinately fond of poetry; they could recite page after page of Kipling, and were nearly as fond of Rhysling, "the blind singer of the spaceways."

BOBO backed in. Joe-Jim hooked a thumb toward Hugh. "Look," said Joe, "he's going out."

"Now?" said Bobo happily, and grinned, slavering.

"You and your stomach!" Joe answered, rapping Bobo's pate with his knuckles. "No, you don't eat him. You and him—blood brothers. Get it?"

"Not eat 'im?"

"No. Fight for him. He fights for you."

"O. K." The pinhead shrugged his shoulders at the inevitable. "Blood brothers. Bobo know."

"All right. Now we go up to the place-where-everybody-flies. You go ahead and make lookout."

They climbed in single file, the

dwarf running ahead to spot the lay of the land, Hoyland behind him, Joe-Jim bringing up the rear, Joe with eyes to the front, Jim watching their rear, head turned over his shoulder.

Higher and higher they went, weight slipping imperceptibly from them with each successive deck. They emerged finally into a level beyond which there was no further progress, no opening above them. The deck curved gently, suggesting that the true shape of the space was a giant cylinder, but overhead a metallic expanse which exhibited a similar curvature obstructed the view and prevented one from seeing whether or not the deck in truth curved back on itself.

There were no proper bulkheads; great stanchions, so huge and squat as to give an impression of excessive, unnecessary strength, grew thickly about them, spacing deck and overhead evenly apart.

Weight was imperceptible. If one remained quietly in one place, the undetectable residuum of weight would bring the body in a gentle drift down to the "floor," but up and down were terms largely lacking in meaning. Hugh did not like it, it made him gulp, but Bobo seemed delighted by it and not unused to it. He moved through the air like an uncouth fish, banking off stanchion, floor plate, and overhead as suited his convenience.

JOE-JIM set a course parallel to the common axis of the inner and outer cylinders, following a passageway formed by the orderly spacing of the stanchions. There were handrails set along the passage, one of which he followed like a spider on its thread. He made remarkable speed, which Hugh floundered to maintain. In time, he caught the trick of the

easy, effortless, overhand pull, the long coast against nothing but air resistance, and the occasional flick of the toes or the hand against the floor. But he was much too busy to tell how far they went before they stopped. Miles, he guessed it to be, but he did not know.

When they did stop, it was because the passage had terminated. A solid bulkhead, stretching away to right and left, barred their way. Joe-Jim moved along it to the right, searching.

He found what he sought, a man-sized door, closed, its presence distinguishable only by a faint crack which marked its outline and a curvise geometrical design on its surface. Joe-Jim studied this and scratched his right-hand head. The two heads whispered to each other, Joe-Jim raised his hand in an awkward gesture.

"No, no!" said Jim. Joe-Jim checked himself. "How's that?" Joe answered. They whispered together again, Joe nodded, and Joe-Jim again raised his hand.

He traced the design on the door without touching it, moving his forefinger through the air perhaps four inches from the surface of the door. The order of succession in which his finger moved over the lines of the design appeared simple but certainly not obvious.

Finished, he shoved a palm against the adjacent bulkhead, drifted back from the door, and waited.

A moment later there was a soft, almost inaudible insufflation; the door stirred and moved outward perhaps six inches, then stopped. Joe-Jim appeared puzzled. He ran his hands cautiously into the open crack and pulled. Nothing happened. He called to Bobo. "Open it."

Bobo looked the situation over, with a scowl on his forehead which

wrinkled almost to his crown. He then placed his feet against the bulkhead, steadying himself by grasping the door with one hand. He took hold of the edge of the door with both hands, settled his feet firmly, bowed his body and strained.

He held his breath, chest rigid, back bent, sweat breaking out from the effort. The great cords in his neck stood out, making of his head a misshapen pyramid. Hugh could hear the dwarf's joints crack. It was easy to believe that he would kill himself with the attempt, too stupid to give up.

But the door gave suddenly, with a plaint of binding metal. As the door, in swinging out, slipped from Bobo's fingers, the unexpectedly released tension in his legs shoved him heavily away from the bulkhead; he plunged down the passageway, floundering for a hand hold. But he was back in a moment, drifting awkwardly through the air as he massaged a cramped calf.

Joe-Jim led the way inside, Hugh close behind him. "What is this place?" demanded Hugh, his curiosity overcoming his servant manners.

"The Main Control Room," said Joe.

MAIN Control Room! The most sacred and taboo place in the Ship, its very location a forgotten mystery. In the credo of the young men it was nonexistent. The older scientists varied in their attitude between fundamentalist acceptance and mystical belief. As enlightened as Hugh believed himself to be, the very words frightened him. The Control Room! Why, the very spirit of Jordan was said to reside there.

He stopped.

Joe-Jim stopped and Joe looked

around. "Come on," he said. "What's the matter?"

"Why . . . uh . . . uh—"

"Speak up."

"But . . . but this place is haunted . . . this is Jordan's—"

"Oh, for Jordan's sake!" protested Joe, with slow exasperation. "I thought you told me you young punks didn't take any stock in Jordan."

"Yes, but . . . but this is—"

"Stow it. Come along, or I'll have Bobo drag you." He turned away. Hugh followed, reluctantly, as a man climbs a scaffold.

THEY THREADED through a passageway just wide enough for two to use the handrails abreast. The passage curved in a wide-sweeping arc of full ninety degrees, then opened into the control room proper. Hugh peered past Joe-Jim's broad shoulders, fearful but curious.

He stared into a well-lighted room, huge, quite two hundred feet across. It was spherical, the interior of a great globe. The surface of the globe was featureless, frosted silver. In the geometrical center of the sphere Hugh saw a group of apparatus about fifteen feet across. To his inexperienced eye, it was completely unintelligible; he could not have described it, but he saw that it floated steadily, with no apparent support.

Running from the end of the passage to the mass at the center of the globe was a tube of metal lattice-work, wide as the passage itself. It offered the only exit from the passage. Joe-Jim turned to Bobo, and ordered him to remain in the passageway, then entered the tube.

He pulled himself along it, hand over hand, the bars of the lattice-work making a ladder. Hugh followed him, they emerged into the mass of apparatus occupying the

center of the sphere. Seen close up, the gear of the control station resolved itself into its individual details, but it still made no sense to him. He glanced away from it to the inner surface of the globe which surrounded them.

That was a mistake. The surface of the globe, being featureless silvery white, had nothing to lend it perspective. It might have been a hundred feet away, or a thousand, or many miles. He had never experienced an unbroken height greater than that between two decks, nor an open space larger than the village common. He was panic-stricken, scared out of wit, the more so in that he did not know what it was he feared. But the ghost of long forgotten jungle ancestors possessed

him and chilled his stomach with the basic primitive fear of falling.

He clutched at the control gear, clutched at Joe-Jim.

Joe-Jim let him have one, hard across the mouth with the flat of his hand. "What's the matter with you?" growled Jim.

"I don't know," Hugh presently managed to get out. "I don't know, but I don't like this place. Let's get out of here!"

Jim lifted his eyebrows to Joe, looked disgusted, and said, "We might as well. That weak-bellied baby will never understand anything you tell him."

"Oh, he'll be all right," Joe replied, dismissing the matter. "Hugh, climb into one of the chairs—there, that one."

In the meantime, Hugh's eyes had fallen on the tube whereby they had reached the control center and had followed it back by eye to the passage door. The sphere suddenly shrank to its proper focus and the worst of his panic was over. He complied with the order, still trembling, but able to obey.

THE control center consisted of a rigid framework, made up of chairs, or frames, to receive the bodies of the operators, and consolidated instrument and report panels, mounted in such a fashion as to be almost in the laps of the operators, where they were readily visible but did not obstruct the view. The chairs had high supporting sides, or arms, and mounted in these arms were the controls appropriate to each officer on watch—but Hugh was not yet aware of that.

He slid under the instrument panel into his seat and settled back, glad of its enfolding stability. It fitted him in a semireclining position, foot-rest to head support.



But something was happening on the panel in front of Joe-Jim; he caught it out of the corner of his eye and turned to look. Bright-red letters glowed near the top of the board: 2ND ASTROGATOR POSTED. What was a second astrogator? He didn't know—then he noticed that the extreme top of his own board was labeled 2ND ASTROGATOR and concluded it must be himself, or rather, the man who should be sitting there. He felt momentarily uncomfortable that the proper second astrogator might come in and find him usurping his post, but he put it out of his mind—it seemed unlikely.

But what was a second astrogator, anyhow?

The letters faded from Joe-Jim's board, a red dot appeared on the left-hand edge and remained. Joe-Jim did something with his right hand; his board reported: ACCELERATION—ZERO, then MAIN DRIVE. The last two words blinked several times, then were replaced with NO REPORT. These words faded out, and a bright-green dot appeared near the right-hand edge.

"Get ready," said Joe, looking toward Hugh, "the light is going out."

"You're not going to turn out the light?" protested Hugh.

"No—you are. Take a look by your left hand. See those little white lights?"

Hugh did so, and found, shining up through the surface of the chair arm, eight bright little beads of light arranged in two squares, one above the other.

"Each one controls the light of one quadrant," explained Joe. "Cover them with your hand to turn out the light. Go ahead—do it."

Reluctantly, but fascinated, Hugh did as he was directed. He placed a

palm over the tiny lights, and waited. The silvery sphere turned to dull lead, faded still more, leaving them in darkness complete save for the slight glow from the instrument panels. Hugh felt nervous but exhilarated. He withdrew his palm, the sphere remained dark, the eight little lights had turned blue.

"Now," said Joe, "I'm going to show you the stars!"

In the darkness, Joe-Jim's right hand slid over another pattern of eight lights.

CREATION.

Faithfully reproduced, shining as steady and serene from the walls of the stellarium as did their originals from the black depths of space, the mirrored stars looked down on him. Light after jeweled light, scattered in careless bountiful splendor across the simulacrum sky, the countless suns lay before him—before him, over him, under him, behind him, in every direction from him. He hung alone in the center of the stellar universe.

"Ooooooh!" It was an involuntary sound, caused by his indrawn breath. He clutched the chair arms hard enough to break fingernails, but he was not aware of it. Nor was he afraid at the moment; there was room in his being for but one emotion. Life within the Ship, alternately harsh and workaday, had placed no strain on his innate capacity to experience beauty; for the first time in his life he knew the intolerable ecstasy of beauty unalloyed. It shook him and hurt him, like the first trembling intensity of sex.

It was some time before Hugh sufficiently recovered from the shock and the ensuing intense preoccupation to be able to notice Jim's sardonic laugh, Joe's dry chuckle. "Had enough?" inquired Joe. Without

waiting for a reply, Joe-Jim turned the lights back on, using the duplicate controls mounted in the left arm of his chair.

Hugh sighed. His chest ached and his heart pounded. He realized suddenly that he had been holding his breath the entire time that the lights had been turned out. "Well, smart boy," asked Jim, "are you convinced?"

Hugh sighed again, not knowing why. With the lights back on, he felt safe and snug again, but was possessed of a deep sense of personal loss. He knew, subconsciously, that, having seen the stars, he would never be happy again. The dull ache in his breast, the vague inchoate yearning for his lost heritage of open sky and stars was never to be silenced, even though he was yet too ignorant to be aware of it at the top of his mind. "What was it?" he asked in a hushed voice.

"That's it," answered Joe. "That's the world. That's the universe. That's what I've been trying to tell you about."

Hugh tried furiously to force his inexperienced mind to comprehend. "That's what you mean by Outside?" he asked. "All those beautiful little lights?"

"Sure," said Joe, "only they aren't little. They're a long way off, you see—maybe thousands of miles."

"What?"

"Sure, sure," Joe persisted. "There's lots of room out there. Space. It's big. Why, some of those stars may be as big as the Ship—maybe bigger."

Hugh's face was a pitiful study in overstrained imagination. "Bigger than the Ship?" he repeated. "But . . . but—"

Jim tossed his head impatiently and said to Joe, "Wha' d' I tell you?

You're wasting our time on this lunk. He hasn't got the capacity—"

"Easy, Jim," Joe answered mildly, "don't expect him to run before he can crawl. It took us a long time. I seem to remember that you were a little slow to believe your own eyes."

"That's a lie," said Jim nastily. "You were the one that had to be convinced."

"O. K., O. K.," Joe conceded, "let it ride. But it was a long time before we both had it all straight."

Hoyland paid little attention to the exchange between the two brothers. It was a usual thing; his attention was centered on matters decidedly not usual. "Joe," he asked, "what became of the Ship while we were looking at the stars? Did we stare right through it?"

"Not exactly," Joe told him. "You weren't looking directly at the stars at all, but at kind of a picture of them. It's like— Well, they do it with mirrors, sort of. I've got a book that tells about it."

"But you *can* see 'em directly," volunteered Jim, his momentary pique forgotten. "There's a compartment forward of here—"

"Oh, yes," put in Joe, "it slipped my mind. The Captain's veranda. 'S got one wall of glass; you can look right out."

"The Captain's veranda? But—"

"Not *this* Captain. He's never been near the place. That's the name over the door of the compartment."

"What's a 'veranda'?"

"Blessed if I know. It's just the name of the place."

"Will you take me up there?"

Joe appeared to be about to agree, but Jim cut in. "Some other time. I want to get back—I'm hungry."

They passed back through the tube, woke up Bobo, and made the long trip back down.

IT WAS long before Hugh could persuade Joe-Jim to take him exploring again, but the time intervening was well spent. Joe-Jim turned him loose on the largest collection of books that Hugh had ever seen. Some of them were copies of books Hugh had seen before, but even these he read with new meanings. He read incessantly, his mind soaking up new ideas, stumbling over them, struggling, striving to grasp them. He begrudged sleep, he forgot to eat until his breath grew sour and compelling pain in his midriff forced him to pay attention to his body. Hunger satisfied, he would be back at it until his head ached and his eyes refused to focus.

Joe-Jim's demands for service were few. Although Hugh was never off duty, Joe-Jim did not mind him reading as long as he was within ear-shot and ready to jump when called. Playing checkers with one of the pair when the other did not care to play was the service which used up the most time, and even this was not a total loss, for, if the player were Joe, he could almost always be diverted into a discussion of the Ship, its history, its machinery and equipment, the sort of people who had built it and first manned it—and *their* history, back on Earth, Earth the incredible, that strange place where people had lived on the *outside* instead of the *inside*.

Hugh wondered why they did not fall off.

He took the matter up with Joe and at last gained some notion of gravitation. He never really understood it emotionally—it was too wildly improbable—but as an intellectual concept he was able to accept it and use it, much later, in his first vague glimmerings of the science of ballistics and the art of astrogation and ship maneuvering. And it

led in time to him wondering about weight in the Ship, a matter that had never bothered him before. The lower the level the greater the weight had been to his mind simply the order of nature, and nothing to wonder at. He was familiar with centrifugal force as it applied to slingshots. To apply it also to the whole Ship, to think of the Ship as spinning like a slingshot and thereby causing weight, was too much of a hurdle—he never really believed it.

Joe-Jim took him back once more to the Control Room and showed him what little Joe-Jim knew about the manipulation of the controls and the reading of the astrogation instruments.

The long-forgotten engineer-designers employed by the Jordan Foundation had been instructed to design a ship that would not—*could* not—wear out, even though the Trip were protracted beyond the expected sixty years. They builded better than they knew. In planning the main drive engines and the auxiliary machinery, largely automatic, which would make the Ship habitable, and in designing the controls necessary to handle all machinery not entirely automatic the very idea of moving parts had been rejected. The engines and auxiliary equipment worked on a level below mechanical motion, on a level of pure force, as electrical transformers do. Instead of push buttons, levers, cams, and shafts, the controls and the machinery they served were planned in terms of balance between static fields, bias of electronic flow, circuits broken or closed by a hand placed over a light.

On this level of action, friction lost its meaning, wear and erosion took no toll. Had all hands been killed in the mutiny, the Ship would still have plunged on through space,

still lighted, its air still fresh and moist, its engines ready and waiting. As it was, though elevators and conveyor belts fell into disrepair, disuse, and finally into the oblivion of forgotten function, the essential machinery of the Ship continued its automatic service to its ignorant human freight, or waited, quiet and ready, for someone bright enough to puzzle out its key.

Genius had gone into the building of the Ship. Far too huge to be assembled on Earth, it had been put together piece by piece in its own orbit out beyond the Moon. There it had swung for fifteen silent years while the problems presented by the decision to make its machinery fool-proof and enduring had been formulated and solved. A whole new field of sub-molar action had been conceived in the process, struggled with, and conquered.

So— When Hugh placed an untutored, questing hand over the first of a row of lights marked ACCELERATION, POSITIVE, he got an immediate response, though not in terms of acceleration. A red light at the top of the chief pilot's board blinked rapidly and the annunciator panel glowed with a message: MAIN ENGINES—NOT MANNED.

"What does that mean?" he asked Joe-Jim.

"There's no telling," said Jim. "We've done the same thing in the main engine room," added Joe. "There, when you try it, it says 'Control Room Not Manned.'"

Hugh thought a moment. "What would happen," he persisted, "if all the control stations had somebody at 'em at once, and then I did that?"

"Can't say," said Joe. "Never been able to try it."

Hugh said nothing. A resolve which had been growing, formless, in

his mind was now crystallizing into decision. He was busy with it.

HE WAITED until he found Joe-Jim in a mellow mood, both of him, before broaching his idea. They were in the Captain's veranda at the time Hugh decided the moment was ripe. Joe-Jim rested gently in the Captain's easy-chair, his belly full of food, and gazed out through the heavy glass of the view port at the serene stars. Hugh floated beside him. The spinning of the Ship caused the stars to appear to move in stately circles.

Presently he said, "Joe-Jim—"

"Eh? What's that, youngster?"

It was Joe who had replied.

"It's pretty swell, isn't it?"

"What is?"

"All that. The stars." Hugh indicated the view through the port with a sweep of his arm, then caught at the chair to stop his own back spin.

"Yeah, it sure is. Makes you feel good." Surprisingly it was Jim who offered this.

Hugh knew the time was right. He waited a moment, then said, "Why don't we finish the job?"

Two heads turned simultaneously, Joe leaning out a little to see past Jim. "What job?"

"The Trip. Why don't we start up the main drive and go on with it. Somewhere out there," he said hurriedly to finish before he was interrupted, "there are planets like Earth—or so the First Crew thought. Let's go find them."

Jim looked at him, then laughed. Joe shook his head slowly. "Kid," he said, "you don't know what you are talking about. You're as balmy as Bobo. No," he went on, "that's all over and done with. Forget it."

"Why is it over and done with, Joe?"

"Well, because— It's too big a job. It takes a crew that understands what it's all about, trained to operate the Ship."

"Does it take so many? You have only shown me about a dozen places, all told, for men to actually be at the controls. Couldn't a dozen men run the Ship—if they knew what you know," he added slyly.

Jim chuckled. "He's got you, Joe. He's right."

Joe brushed it aside. "You overrate our knowledge. Maybe we *could* operate the Ship, but we wouldn't get anywhere. We don't know where we are. The Ship has been drifting for I don't know how many generations. We don't know where we're headed, or how fast we're going."

"But look," Hugh pleaded, "there are instruments. You showed them to me. Couldn't we learn how to use them? Couldn't *you* figure them out, Jim, if you really wanted to?"

"Oh, I suppose so," Jim agreed.

"Don't boast, Jim," said Joe.

"I'm not boasting," snapped Jim. "If a thing'll work, I can figure it out."

"Humph!" said Joe.

THE MATTER rested in delicate balance. Hugh had got them disagreeing among themselves—which was what he wanted—with the less tractable of the pair on his side. Now, to consolidate his gain—

"I had an idea," he said quickly, "to get you men to work with, Jim, if you were able to train them."

"What's your idea," demanded Jim suspiciously.

"Well, you remember what I told you about a bunch of the younger scientists—"

"Those fools!"

"Yes, yes, sure—but they don't know what you know. In their way

they were trying to be reasonable. Now, if I could go back down and tell them what you've taught me, I could get you enough men to work with."

Joe cut in. "Take a good look at us, Hugh. What do you see?"

"Why . . . why . . . I see *you*—Joe-Jim."

"You see a mutie," corrected Joe, his voice edged with sarcasm. "We're a *mutie*. Get that? Your scientists won't work with us."

"No, no," protested Hugh, "that's not true. I'm not talking about peasants. Peasants wouldn't understand, but these are *scientists*, and the smartest of the lot. They'll understand. All you'll need to do is to arrange safe conduct for them through mutie country. You can do that, can't you?" he added, instinctively shifting the point of the argument to firmer ground.

"Why, sure," said Jim.

"Forget it," said Joe.

"Well, O. K.," Hugh agreed, sensing that Joe really was annoyed at his persistence, "but it would be fun—" He withdrew some distance from the brothers.

He could hear Joe-Jim continuing the discussion with himself in low tones. He pretended to ignore it. Joe-Jim had this essential defect in his joint nature: Being a committee, rather than a single individual, he was hardly fitted to be a man of action, since all decisions were necessarily the result of discussion and compromise.

Several moments later Hugh heard Joe's voice raised. "All right, all *right*—have it your own way!" He then called out, "Hugh! Come here!"

Hugh kicked himself away from an adjacent bulkhead and shot over to the immediate vicinity of Joe-Jim, arresting his flight with both hands

against the framework of the Captain's chair.

"We've decided," said Joe without preliminaries, "to let you go back down to high-weight and try to peddle your goods. But you're a fool," he added sourly.

BOBO ESCORTED Hugh down through the dangers of the levels frequented by muties and left him in the uninhabited zone above high-weight. "Thanks, Bobo," Hugh said in parting. "Good eating." The dwarf grinned, ducked his head, and sped away, swarming up the ladder they had just descended.

Hugh turned and started down, touching his knife as he did so. It was good to feel it against him again. Not that it was his original knife. That had been Bobo's prize when he was captured, and Bobo had been unable to return it, having inadvertently left it sticking in a big one that got away. But the replacement Joe-Jim had given him was well balanced and quite satisfactory.

Bobo had conducted him, at Hugh's request and by Joe-Jim's order, down to the area directly over the auxiliary Converter used by the scientists. He wanted to find Bill Ertz, assistant chief engineer and leader of the bloc of younger scientists, and he did not want to have to answer too many questions before he found him.

Hugh dropped quickly down the remaining levels and found himself in a main passageway which he recognized. Good! A turn to the left, a couple of hundred yards' walk, and he found himself at the door of the compartment which housed the Converter. A guard lounged in front of it. Hugh started to push on past, was stopped. "Where do you think you're going?"

"I want to find Bill Ertz."

"You mean the Chief Engineer? Well, he's not here."

"Chief? What's happened to the old one?" Hoyland regretted the remark at once—but it was already out.

"Huh? The old Chief? Why, he's made the Trip long since." The guard looked at him suspiciously. "What's wrong with you?"

"Nothing," denied Hugh. "Just a slip."

"Funny sort of a slip. Well, you'll find Chief Ertz around his office probably."

"Thanks. Good eating."

"Good eating."

HUGH was admitted to see Ertz after a short wait. Ertz looked up from his desk as Hugh came in. "Well," he said, "so you're back, and not dead after all. This is a surprise. We had written you off, you know, as making the Trip."

"Yes, I suppose so."

"Well, sit down and tell me about it—I've a little time to spare at the moment. Do you know, though, I wouldn't have recognized you. You've changed a lot—all that gray hair. I imagine you had some pretty tough times."

Gray hair? Was his hair gray? And Ertz had changed a lot, too, Hugh now noticed. He was paunchy and the lines in his face had set. Good Jordan! How long had he been gone?

Ertz drummed on his desk top, and pursed his lips. "It makes a problem—you coming back like this. I'm afraid I can't just assign you to your old job; Mort Tyler has that. But we'll find a place for you, suitable to your rank."

Hugh recalled Mort Tyler and not too favorably. A precious sort of a chap, always concerned with what was proper and according to regula-

tion. So Tyler had actually made scientishood, and was on Hugh's old job at the Converter. Well, it didn't matter. "That's all right," he began, "I wanted to talk to you about—"

"Of course, there's the matter of seniority," Ertz went on. "Perhaps the council had better consider the matter. I don't know of a precedent. We've lost a number of scientists to the muties in the past, but you are the first to escape with his life in my memory."

"That doesn't matter," Hugh broke in. "I've something much more pressing to talk about. While I was away I found out some amazing things, Bill, things that it is of paramount importance for you to know about. That's why I came straight to you. Listen, I—"

Ertz was suddenly alert. "Of course you have! I must be slowing down. You must have had a marvelous opportunity to study the muties and scout out their territory. Come on, man, spill it! Give me your report."

Hugh wet his lips. "It's not what you think," he said. "It's much more important than just a report on the muties, though it concerns them, too. In fact, we may have to change our whole policy with respect to the mu—"

"Well, go ahead, go ahead! I'm listening."

"All right." Hugh told him of his tremendous discovery as to the actual nature of the Ship, choosing his words carefully and trying very hard to be convincing. He dwelt lightly on the difficulties presented by an attempt to reorganize the Ship in accordance with the new concept and bore down heavily on the prestige and honor that would accrue to the man who led the effort.

He watched Ertz's face as he talked. After the first start of com-

plete surprise when Hugh launched his key idea, the fact that the Ship was actually a moving body in a great outside space, his face became impassive and Hugh could read nothing in it, except that he seemed to detect a keener interest when Hugh spoke of how Ertz was just the man for the job because of his leadership of the younger, more progressive scientists.

When Hugh concluded, he waited for Ertz's response. Ertz said nothing at first, simply continued with his annoying habit of drumming on the top of his desk. Finally he said, "These are important matters, Hoyland, much too important to be dealt with casually. I must have time to chew it over."

"Yes, certainly," Hugh agreed, "I wanted to add that I've made arrangements for safe passage up to no-weight. I can take you up and let you see for yourself."

"No doubt that is best," Ertz replied. "Well—are you hungry?"

"No."

"Then we'll both sleep on it. You can use the compartment back of my office. I don't want you discussing this with anyone else until I've had time to think about it; it might cause unrest if it got out without proper preparation."

"Yes, you're right."

"Very well, then"—Ertz ushered him into a compartment behind his office which he very evidently used for a lounge—"have a good rest," he said, "and we'll talk later."

"Thanks," Hugh acknowledged. "Good eating."

"Good eating."

ONCE he was alone, Hugh's excitement gradually dropped away from him, and he realized that he was fagged out and very sleepy. He

stretched out on a built-in couch and fell asleep.

When he awoke he discovered that the only door to the compartment was barred from the other side. Worse than that, his knife was gone.

He had waited an indefinitely long time when he heard activity at the door. It opened, two husky, unsmiling men entered. "Come along," said one of them. He sized them up, noting that neither of them carried a knife. No chance to snatch one from their belts, then. On the other hand he might be able to break away from them.

But beyond them, a wary distance away in the outer room, were two other equally formidable men, each armed with a knife. One balanced his for throwing, the other held his by the grip, ready to stab at close quarters.

He was boxed in and he knew it. They had anticipated his possible moves.

He had long since learned to relax before the inevitable. He composed his face and marched quietly out. Once through the door he saw Ertz, waiting and quite evidently in charge of the party of men. He spoke to him, being careful to keep his voice calm. "Hello, Bill. Pretty extensive preparations you've made. Some trouble, maybe?"

Ertz seemed momentarily uncertain of his answer, then said, "You're going before the Captain."

"Good!" Hugh answered. "Thanks, Bill. But do you think it's wise to try to sell the idea to him without laying a little preliminary foundation with the others?"

Ertz was annoyed at his apparent thick-headedness and showed it. "You don't get the idea," he growled; "you're going before the Captain to stand trial—for heresy!"

Hugh considered this as if the idea

had not before occurred to him. He answered mildly, "You're off down the wrong passage, Bill. Perhaps a charge and trial is the best way to get at the matter, but I'm not a peasant, simply to be hustled before the Captain. I must be tried by the council. I am a scientist."

"Are you now?" Ertz said softly. "I've had advice about that. You were written off the lists. Just what you are is a matter for the Captain to determine."

Hugh held his peace. It was against him, he could see, and there was no point in antagonizing Ertz. Ertz made a signal; the two unarmed men each grasped one of Hugh's arms. He went with them quietly.

HUGH LOOKED at the Captain with new interest. The old man had not changed much—a little fatter, perhaps.

The Captain settled himself slowly down in his chair, and picked up the memorandum before him. "What's this all about?" he began irritably. "I don't understand it."

Mort Tyler was there to present the case against Hugh, a circumstance which Hugh had had no way of anticipating and which added to his misgivings. He searched his boyhood recollections for some handle by which to reach the man's sympathy, found none. Tyler cleared his throat and commenced:

"This is the case of one Hugh Hoyland, Captain, formerly one of your junior scientists—"

"Scientist, eh? Why doesn't the council deal with him?"

"Because he is no longer a scientist, Captain. He went over to the muties. He now returns among us, preaching heresy and seeking to undermine your authority."

The Captain looked at Hugh with the ready belligerency of a man jeal-

ous of his prerogatives. "Is that so?" he bellowed. "What have you to say for yourself?"

"It is not true, Captain," Hugh answered. "All that I have said to anyone has been an affirmation of the absolute truth of our ancient knowledge. I have not disputed the truths under which we live; I have simply affirmed them more forcibly than is the ordinary custom. I—"

"I still don't understand this," the Captain interrupted, shaking his head. "You're charged with heresy, yet you say you believe the Teachings. If you aren't guilty, why are you here?"

"Perhaps I can clear the matter up," put in Ertz. "Hoyland—"

"Well, I hope you can," the Captain went on. "Come—let's hear it."

Ertz proceeded to give a reasonably correct, but slanted, version of Hoyland's return and his strange story. The Captain listened, with an expression that varied between puzzlement and annoyance.

When Ertz had concluded the Captain turned to Hugh. "Humph!" he said.

Hugh spoke immediately. "The gist of my contention, Captain, is that there is a place up at no-weight where you can actually *see* the truth of our faith that the Ship is moving, where you can actually see Jordan's Plan in operation. That is not a denial of faith; that affirms it. There is no need to take my word for it. Jordan Himself will prove it."

Seeing that the Captain appeared to be in a state of indecision, Tyler broke in:

"Captain, there is a possible explanation of this incredible situation which I feel duty bound that you should hear. Offhand, there are two obvious interpretations of Hoyland's ridiculous story: He may simply be guilty of extreme heresy, or he may

be a mutie at heart and engaged in a scheme to lure you into their hands. But there is a third more charitable explanation and one which I feel within me is probably the true one.

"There is record that Hoyland was seriously considered for the Converter at his birth inspection, but that his deviation from normal was slight, being simply an overlarge head, and he was passed. It seems to me that the terrible experiences he has undergone at the hands of the muties has finally unhinged an unstable mind. The poor chap is simply not responsible for his own actions."

Hugh looked at Tyler with new respect. To absolve him of guilt and at the same time to make absolutely certain that Hugh would wind up making the Trip—how neat!

The Captain shook a palm at them. "This has gone on long enough." Then, turning to Ertz, "Is there recommendation?"

"Yes, Captain. The Converter."

"Very well, then. I really don't see, Ertz," he continued testily, "why I should be bothered with these details. It seems to me that you should be able to handle discipline in your department without my help."

"Yes, Captain."

The Captain shoved back from his desk, started to get up. "Recommendation confirmed. Dismissed."

Anger flooded through Hugh at the unreasonable injustice of it. They had not even considered looking at the only real evidence he had in his defense. He heard a shout, "Wait!"—then discovered it was his own voice.

The Captain paused, looking at him.

"Wait a moment," Hugh went on, his words spilling out of their own

accord. "This won't make any difference, for you're all so damn sure you know all the answers that you won't consider a fair offer to come see with your own eyes. Nevertheless—

"Nevertheless—it *still* moves!"

HUGH HAD PLENTY of time to think, lying in the compartment where they confined him to await the power needs of the Converter, time to think, and to second-guess his mistakes. Telling his tale to Ertz immediately—that had been mistake No. 1. He should have waited, become reacquainted with the man and felt him out, instead of depending on a friendship which had never been very close.

Second mistake, Mort Tyler. When he heard his name he should have investigated and found out just how much influence the man had with Ertz. He had known him of old, he should have known better.

Well, here he was, condemned as a mutant—or maybe as an heretic. It came to the same thing. He considered whether or not he should have tried to explain why mutants happened. He had learned about it himself in some of the old records in

Joe-Jim's possession. No, it wouldn't wash. How could you explain about radiations from the Outside causing the birth of mutants when the listeners did not believe there was such a place as Outside? No, he had messed it up before he was ever taken before the Captain.

His self-recriminations were disturbed at last by the sound of his door being unfastened. It was too soon for another of the infrequent meals; he thought that they had come at last to take him away, and renewed his resolve to take someone with him.

But he was mistaken. He heard a voice of gentle dignity, "Son, Son, how does this happen?" It was Lieutenant Nelson, his first teacher, looking older than ever and frail.

The interview was distressing for both of them. The old man, childless himself, had cherished great hopes for his protégé, even the ambition that he might eventually aspire to the captaincy, though he had kept his vicarious ambition to himself, believing it not good for the young to praise them too highly. It had hurt his heart when the youth was lost.

Now he had returned, a man, but



under disgraceful conditions and under sentence of death.

The meeting was no less unhappy for Hugh. He had loved the old man, in his way, wanted to please him and needed his approval. But he could see, as he told his story, that Nelson was not capable of treating the story as anything but an aberration of Hugh's mind, and he suspected that Nelson would rather see him meet a quick death in the Converter, his atoms smashed to hydrogen and giving up clean useful power, than have him live to make a mock of the ancient teachings.

In that he did the old man an injustice; he underrated Nelson's mercy, but not his devotion to "science." But let it be said for Hugh that, had there been no more at issue than his own personal welfare, he might have preferred death to breaking the heart of his benefactor—being a romantic and more than a bit foolish.

Presently the old man got up to leave, the visit having grown unendurable to each of them. "Is there anything I can do for you, Son? Do they feed you well enough?"

"Quite well, thanks," Hugh lied.

"Is there anything else?"

"No—yes, you might send me some tobacco. I haven't had a chew in a long time."

"I'll take care of it. Is there anyone you would like to see?"

"Why, I was under the impression that I was not permitted visitors—ordinary visitors."

"You are right, but I think perhaps I may be able to get the rule relaxed. But you will have to give me your promise not to speak of your heresy," he added anxiously.

Hugh thought quickly. This was a new aspect, a new possibility. His uncle? No, while they had always gotten along well, their minds did

not meet—they would greet each other as strangers. He had never made friends easily; Ertz had been his obvious next friend and now look at the damned thing! Then he recalled his village chum, Alan Mahoney, with whom he had played as a boy. True, he had seen practically nothing of him since the time he was apprenticed to Nelson. Still—

"Does Alan Mahoney still live in our village?"

"Why, yes."

"I'd like to see him, if he'll come."

ALAN ARRIVED, nervous, ill at ease, but plainly glad to see Hugh and very much upset to find him under sentence to make the Trip. Hugh pounded him on the back. "Good boy," he said, "I knew you would come."

"Of course I would," protested Alan, "once I knew. But nobody in the village knew it. I don't think even the Witness knew it."

"Well, you're here, that's what matters. Tell me about yourself. Have you married?"

"Huh, uh, no. Let's not waste time talking about me. Nothing ever happens to me, anyhow. How in Jordan's name did you get in this jam, Hugh?"

"I can't talk about that, Alan. I promised Lieutenant Nelson that I wouldn't."

"Well, what's a promise—that kind of a promise. You're in a jam, fellow."

"Don't I know it!"

"Somebody have it in for you?"

"Well—our old pal Mort Tyler didn't help any; I think I can say that much."

Alan whistled and nodded his head slowly. "That explains a lot."

"How come? You know something?"

"Maybe, maybe not. After you

went away he married Edris Baxter."

"So? Hm-m-m—yes, that clears up a lot." He remained silent for a time.

Presently Alan spoke up: "Look, Hugh. You're not going to sit here and take it, are you? Particularly with Tyler mixed in it. We gotta get you outa here."

"How?"

"I don't know. Pull a raid, maybe. I guess I could get a few knives to rally round and help us—all good boys, spoiling for a fight."

"Then, when it's over, we'd all be for the Converter. You, me, and your pals. No, it won't wash."

"But we've got to do something. We can't just sit here and wait for them to burn you."

"I know that." Hugh studied Alan's face. Was it a fair thing to ask? He went on, reassured by what he had seen. "Listen. You would do anything you could to get me out of this, wouldn't you?"

"You know that." Alan's tone showed hurt.

"Very well, then. There is a dwarf named Bobo. I'll tell you how to find him—"

ALAN climbed, up and up, higher than he had ever been since Hugh had led him, as a boy, into foolhardy peril. He was older now, more conservative; he had no stomach for it. To the very real danger of leaving the well-traveled lower levels was added his superstitious ignorance. But still he climbed.

This should be about the place—unless he had lost count. But he saw nothing of the dwarf.

Bobo saw him first. A slingshot load caught Alan in the pit of the stomach, even as he was shouting, "Bobo!"

Bobo backed into Joe-Jim's com-

partment and dumped his load at the feet of the twins. "Fresh meat," he said proudly.

"So it is," agreed Jim indifferently. "Well, it's yours; take it away."

The dwarf dug a thumb into a twisted ear. "Funny," he said, "he knows Bobo's name."

Joe looked up from the book he was reading—Browning's "Collected Poems," L-Press, New York, London, Luna City, cr. 3/5—"That's interesting. Hold on a moment."

Hugh had prepared Alan for the shock of Joe-Jim's appearance. In reasonably short order he collected his wits sufficiently to be able to tell his tale. Joe-Jim listened to it without much comment, Bobo with interest but little comprehension.

When Alan concluded, Jim remarked, "Well, you win, Joe. He didn't make it." Then, turning to Alan, he added, "You can take Hoyaland's place. Can you play checkers?"

Alan looked from one head to the other. "But you don't understand," he said. "Aren't you going to do anything about it?"

Joe looked puzzled. "Us? Why should we?"

"But you've got to. Don't you see? He's depending on you. There's nobody else he can look to. That's why I came. Don't you see?"

"Wait a moment," drawled Jim, "wait a moment. Keep your belt on. Supposing we did want to help him—which we don't—how in Jordan's Ship could we? Answer me that."

"Why . . . why—" Alan stumbled in the face of such stupidity. "Why, get up a rescue party, of course, and go down and get him out!"

"Why should we get ourselves killed in a fight to rescue your friend?"

Bobo pricked his ears. "Fight?" he inquired eagerly.

"No, Bobo," Joe denied. "No fight. Just talk."

"Oh," said Bobo and returned to passivity.

Alan looked at the dwarf. "If you'd even let Bobo and me—"

"No," Joe said shortly. "It's out of the question. Shut up about it."

Alan sat in a corner, hugging his knees in despair. If only he could get out of there. He could still try to stir up some help down below. The dwarf seemed to be asleep, though it was difficult to be sure with him. If only Joe-Jim would sleep, too.

Joe-Jim showed no indication of sleepiness. Joe tried to continue reading, but Jim interrupted him from time to time. Alan could not hear what they were saying.

Presently Joe raised his voice. "Is that your idea of fun?" he demanded.

"Well," said Jim, "it beats checkers."

"It does, does it? Suppose you get a knife in your eye—where would I be then?"

"You're getting old, Joe. No juice in you any more."

"You're as old as I am."

"Yeah, but I got young ideas."

"Oh, you make me sick. Have it your own way—but don't blame me. Bobo!"

The dwarf sprang up at once, alert. "Yeah, Boss."

"Go out and dig up Squatty and Long Arm and Pig." Joe-Jim got up, went to a locker, and started pulling knives out of their racks.

HUGH HEARD the commotion in the passageway outside his prison. It could be the guards coming to take him to the Converter, though they probably wouldn't be so noisy. Or it could be just some excitement un-

related to him. On the other hand it might be—

It was. The door burst open, and Alan was inside, shouting at him and thrusting a brace of knives into his hands. He was hurried out the door, while stuffing the knives in his belt and accepting two more.

Outside he saw Joe-Jim, who did



not see him at once, as he was methodically letting fly, as calmly as if he had been engaging in target practice in his own study. And Bobo, who ducked his head and grinned with a mouth widened by a bleeding cut, but continued the easy flow of the motion whereby he loaded and let fly. There were three others, two

of whom Hugh recognized as belonging to Joe-Jim's privately owned gang of bullies—muties by definition and birthplace; they were not deformed.

The count does not include still forms on the floor plates.

"Come on!" yelled Alan. "There'll be more in no time." He hurried down the passage to the right.

Joe-Jim desisted and followed him. Hugh let one blade go for luck at a figure running away to the left. The target was poor, and he had no time to see if he had drawn blood. They scrambled along the passage, Bobo bringing up the rear, as if reluctant to leave the fun, and came to a point where a side passage crossed the main one.

Alan led them to the right again. "Stairs ahead," he shouted.

They did not reach them. An airtight door, rarely used, clanged in their faces ten yards short of the stairs. Joe-Jim's bravoës checked their flight and looked doubtfully at their master. Bobo broke his thickened nails trying to get a purchase on the door.

The sounds of pursuit were clear behind them.

"Boxed in," said Joe softly. "I hope you like it, Jim."

Hugh saw a head appear around the corner of the passage they had quitted. He threw overhand but the distance was too great; the knife clanged harmlessly against steel. The head disappeared. Long Arm kept his eye on the spot, his sling loaded and ready.

Hugh grabbed Bobo's shoulder. "Listen! Do you see that light?"

The dwarf blinked stupidly. Hugh pointed to the intersection of the glowtubes where they crossed in the overhead directly above the junction of the passages. "That light. Can you hit them where they cross?"

Bobo measured the distance with his eye. It would be a hard shot under any conditions at that range. Here, constricted as he was by the low passageway, it called for a fast, flat trajectory, and allowance for higher weight than he was used to.

He did not answer. Hugh felt the wind of his swing but did not see the shot. There was a tinkling crash; the passage became dark.

"Now!" yelled Hugh, and led them away at a run. As they neared the intersection he shouted, "Hold your breaths! Mind the gas!" The radioactive vapor poured lazily out from the broken tube above and filled the crossing with a greenish mist.

Hugh ran to the right, thankful for his knowledge as an engineer of the lighting circuits. He had picked the right direction; the passage ahead was black, being serviced from beyond the break. He could hear footsteps around him; whether they were friend or enemy he did not know.

They burst into light. No one was in sight but a scared and harmless peasant who scurried away at an unlikely pace. They took a quick muster. All were present, but Bobo was making heavy going of it.

Joe looked at him. "He sniffed the gas, I think. Pound his back."

Pig did so with a will. Bobo belched deeply, was suddenly sick, then grinned.

"He'll do," decided Joe.

The slight delay had enabled one at least to catch up with them. He came plunging out of the dark, unaware of, or careless of, the strength against him. Alan knocked Pig's arm down, as he raised it to throw.

"Let me at 'im!" he demanded.

"He's mine!"

It was Tyler.

"Man-fight?" Alan challenged, thumb on his blade.

Tyler's eyes darted from adversary

to adversary and accepted the invitation to individual duel by lunging at Alan. The quarters were too cramped for throwing; they closed, each achieving his grab in parry, fist to wrist.

Alan was stockier, probably stronger; Tyler was slippery. He attempted to give Alan a knee to the crotch. Alan evaded it, stomped on Tyler's planted foot. They went down. There was a crunching crack.

A moment later, Alan was wiping his knife against his thigh. "Let's get goin'," he complained. "I'm scared."

THEY REACHED a stairway, and raced up it, Long Arm and Pig ahead to fan out on each level and cover their flanks, and the third of the three choppers—Hugh heard him called Squatty—covering the rear. The others bunched in between.

Hugh thought they had won free when he heard shouts and the clatter of a thrown knife just above him. He reached the level above in time to be cut not deeply but jaggedly by a ricocheted blade.

Three men were down. Long Arm had a blade sticking in the fleshy part of his upper arm, but it did not seem to bother him. His sling shot was still spinning. Pig was scrambling after a thrown knife, his own armament exhausted. But there were signs of his work; one man was down on one knee some twenty feet away. He was bleeding from a knife wound in the thigh.

As the figure steadied himself with one hand against the bulkhead and reached toward an empty belt with the other, Hugh recognized him.

Bill Ertz.

He had led a party up another way and flanked them, to his own ruin. Bobo crowded behind Hugh

and got his mighty arm free for the cast. Hugh caught at it. "Easy, Bobo," he directed. "In the stomach, and easy."

The dwarf looked puzzled, but did as he was told. Ertz folded over at the middle and slid to the deck.

"Well placed," said Jim.

"Bring him along, Bobo," directed Hugh, "and stay in the middle." He ran his eye over their party, now huddled at the top of that flight of stairs. "All right, gang—up we go again! Watch it."

Long Arm and Pig swarmed up the next flight, the others disposing themselves as usual. Joe looked annoyed. In some fashion—a fashion by no means clear at the moment—he had been eased out as leader of this gang—his gang—and Hugh was giving orders. He reflected that there was no time now to make a fuss. It might get them all killed.

Jim did not appear to mind. In fact he seemed to be enjoying himself.

THEY PUT ten more levels behind them with no organized opposition. Hugh directed them not to kill peasants unnecessarily. The three braves obeyed; Bobo was too loaded down with Ertz to constitute a problem in discipline. Hugh saw to it that they put thirty-odd more decks below them and were well into no-man's-land before he let vigilance relax at all. Then he called a halt and they examined wounds.

The only deep ones were to Long Arm's arm and Bobo's face. Joe-Jim examined them and applied presses with which he had outfitted himself before starting. Hugh refused treatment for his flesh wound. "It's stopped bleeding," he insisted, "and I've got a lot to do."

"You've got nothing to do but to

get up home," said Joe, "and that will be an end to this foolishness."

"Not quite," denied Hugh. "You may be going home, but Alan and I and Bobo are going up to no-weight—to the Captain's veranda."

"Nonsense," said Joe. "What for?"

"Come along if you like, and see. All right, gang. Let's go."

Joe started to speak, stopped when Jim kept still. Joe-Jim followed along.

They floated gently through the door of the veranda, Hugh, Alan, Bobo with his still passive burden—and Joe-Jim. "That's it," said Hugh to Alan, waving his hand at the splendid stars, "that's what I've been telling you about."

Alan looked and clutched at Hugh's arm. "Jordan!" he moaned.

THE END.

"We'll fall out!" He closed his eyes tightly.

Hugh shook him. "It's all right," he said. "It's grand. Open your eyes."

Joe-Jim touched Hugh's arm. "What's it all about?" he demanded. "Why did you bring him up here?" He pointed at Ertz.

"Oh—him. Well, when he wakes up I'm going to show him the stars, prove to him that the Ship moves."

"Well? What for?"

"Then I'll send him back down to convince some others."

"Hm-m-m—suppose he doesn't have any better luck than you had?"

"Why, then"—Hugh shrugged his shoulders—"why then we shall just have to do it all over, I suppose, till we do convince them."

"We've got to do it, you know."

UNKNOWN ANNOUNCES A BOOK

Unknown, Astounding's companion fantasy magazine, printed L. Sprague de Camp's novel, "Lest Darkness Fall," a while back. Now, in a somewhat expanded version, Henry Holt & Co. has it out in book form.

"Lest Darkness Fall" is a "Connecticut Yankee" type yarn, in basis, but with the prime difference that it's logical. It doesn't go in for sow's-ear silk purses, so to speak. Martin Padway, American and twentieth-century archaeologist, is dropped back into the declining days of the Roman Empire with all the tools, gadgets and what not in his pockets or on his person. They amount to a fountain pen and a wrist watch. Question is, at first, not so much, "What could a modern man, with modern knowledge, do in Rome?" but, "How can a man chisel out enough cash to eat?"

He can't make machine guns, however much he'd like to, without the machines to make the machine tools that make the machine-gun-making machines. Not being an expert chemist, physicist, physician, engineer, metallurgist and die maker combined, Martin Padway has difficulties in a mechanical way. He also has difficulties with the local religious authorities. The political authorities don't like his ways. The trade guilds don't like him.

And Padway doesn't like the idea that the Dark Ages are soon to come. He wants to keep darkness from falling. And, principally, he doesn't like being drawn and quartered, or otherwise eliminated.

Told by de Camp, it makes a lovely yarn. If you read it in *Unknown*, you already know it's good; the expanded version includes more de Campisms the magazine couldn't. They make it worth reading in themselves.

Bookstores have it—it's \$2.50.



LIAR!

By Isaac Asimov

***A beautifully logical tale of a robot
who simply couldn't tell the truth!***

Illustrated by Schneeman

ALFRED LANNING lit his cigar carefully, but the tips of his fingers were trembling slightly. His gray eyebrows hunched low as he spoke between puffs.

"It reads minds all right—damn little doubt about *that*! But why?" He looked at Mathematician Peter Bogert, "Well?"

Bogert flattened his black hair

down with both hands, "That was the thirty-fourth RB model we've turned out, Lanning. All the others were strictly orthodox."

The third man at the table frowned. Milton Ashe was the youngest officer of U. S. Robot & Mechanical Men, Inc., and proud of his post.

"Listen, Bogert. There wasn't a hitch in the assembly from start to finish. I guarantee that."

Bogert's thick lips spread in a patronizing smile, "Do you? If you can answer for the entire assembly line, I recommend your promotion. By exact count, there are seventy-five thousand, two hundred and thirty-four operations necessary for the manufacture of a single positronic brain, each separate operation depending for successful completion upon any number of factors, from five to a hundred and five. If any one of them goes seriously wrong, the 'brain' is ruined. I quote our own information folder, Ashe."

Milton Ashe flushed, but a fourth voice cut off his reply.

"If we're going to start by trying to fix the blame on one another, I'm leaving." Susan Calvin's hands were folded tightly in her lap, and the little lines about her thin, pale lips deepened, "We've got a mind-reading robot on our hands and it strikes me as rather important that we find out just *why* it reads minds. We're not going to do that by saying, 'Your fault! My fault!'"

Her cold gray eyes fastened upon Ashe, and he grinned.

Lanning grinned too, and, as always at such times, his long white hair and shrewd little eyes made him the picture of a biblical patriarch, "True for you, Dr. Calvin."

His voice became suddenly crisp, "Here's everything in pill-concentrate form. We've produced a posi-

tronic brain of supposedly ordinary vintage that's got the remarkable property of being able to tune in on thought waves. It would mark the most important advance in robotics in decades, if we knew how it happened. We don't, and we have to find out. Is that clear?"

"May I make a suggestion?" asked Bogert.

"Go ahead!"

"I'd say that until we *do* figure out the mess—and as a mathematician I expect it to be a very devil of a mess—we keep the existence of RB 34 a secret. I mean even from the other members of the staff. As heads of the departments, we ought not to find it an insoluble problem, and the fewer know about it—"

"Bogert is right," said Dr. Calvin. "Ever since the Interplanetary Code was modified to allow robot models to be tested in the plants before being shipped out to space, anti-robot propaganda has increased. If any word leaks out about a robot being able to read minds before we can announce complete control of the phenomenon, Tyrone and his demagogues could make pretty effective capital out of it."

LANNING SUCKED at his cigar and nodded gravely. He turned to Ashe, "I think you said you were alone when you first stumbled on this thought-reading business."

"I'll say I was alone—I got the scare of my life. RB 34 had just been taken off the assembly table and they sent him down to me. Oberrmann was off somewhere, so I took him down to the testing rooms myself—at least I started to take him down." Ashe paused, and a tiny smile tugged at his lips, "Say, did any of you ever carry on a thought conversation without knowing it."

No one bothered to answer, and he continued, "You don't realize it at first, you know. He just spoke to me—as logically and sensibly as you can imagine—and it was only when I was most of the way down to the testing rooms that I realized that *I hadn't said anything*. Sure, I had *thought* lots, but that isn't the same thing, is it? I locked that thing up and ran for Lanning. Having it walking beside me, calmly peering into my thoughts and picking and choosing among them gave me the willies."

"I imagine it would," said Susan Calvin thoughtfully. Her eyes fixed themselves upon Ashe in an oddly intent manner. "We are so accustomed to considering our own thoughts private."

Lanning broke in impatiently, "Then only the four of us know. All right! We've got to go about this systematically. Ashe, I want you to check over the assembly line from beginning to end—everything. You're to eliminate all operations in which there was no possible chance of an error, and list all those where there were, together with its nature and possible magnitude."

"Tall order," grunted Ashe.

"Naturally! Of course, you're to put the men under you to work on this—every single one if you have to, and I don't care if we go behind schedule, either. But they're not to know why, you understand."

"Hm-m-m, yes!" The young technician grinned wryly. "It's still a lulu of a job."

Lanning swiveled about in his chair and faced Calvin, "You'll have to tackle the job from the other direction. You're the robopsychologist of the plant, so you're to study the robot itself and work backwards. Try to find out how he ticks. See what else is tied up with his tele-

pathic powers, how far they extend, how they warp his outlook, and just exactly what harm it has done to his ordinary RB properties. You've got that?"

Lanning didn't wait for Dr. Calvin to answer.

"I'll co-ordinate the work and interpret the findings mathematically." He puffed violently at his cigar and mumbled the rest through the smoke, "Bogert will help me there, of course."

Bogert polished the nails of one pudgy hand with the other and said blandly, "I dare say. I know a little in the line."

"Well! I'll get started." Ashe shoved his chair back and rose. His pleasantly youthful face crinkled in a grin, "I've got the darnedest job of any of us, so I'm getting out of here and to work."

He left with a slurred, "B' seein' ye!"

Susan Calvin answered with a barely perceptible nod, but her eyes followed him out of sight and she did not answer when Lanning grunted and said, "Do you want to go up and see RB 34 now, Dr. Calvin?"

RB 34's photoelectric eyes lifted from the book at the muffled sound of hinges turning and he was upon his feet when Susan Calvin entered.

She paused to readjust the huge "No Entrance" sign upon the door and then approached the robot with a friendly smile.

"I've brought you the texts upon hyperatomic motors, Herbie—a few anyway. Would you care to look at them?"

RB 34—otherwise known as Herbie—lifted the three heavy books from her arms and opened to the title page of one:

"Hm-m-m! 'Theory of Hyperatomics.'" He mumbled inarticu-

lately to himself as he flipped the pages and then spoke with an abstracted air, "Sit down, Dr. Calvin! This will take me a few minutes."

The psychologist seated herself and watched Herbie narrowly as he took a chair at the other side of the table and went through the three books systematically.

At the end of half an hour, he put them down, "Of course, I know why you brought these."

The corner of Dr. Calvin's lip twitched, "I was afraid you would. It's difficult to work with you, Herbie. You're always a step ahead of me."

"It's the same with these books, you know, as with the others. They just don't interest me. There's nothing to your textbooks. Your science is just a mass of collected data plastered together by make-shift theory—and all so incredibly simple, that it's scarcely worth bothering about."

"It's your *fiction* that interests me. Your studies of the interplay of human motives and emotions"—his mighty hand gestured vaguely as he sought the proper words.

Dr. Calvin whispered, "I think I understand."

"I see into minds, you see," the robot continued, "and you have no idea how complicated they are. I can't begin to understand everything because my own mind has so little in common with them—but I try, and your novels help."

"Yes, but I'm afraid that after going through some of the harrowing emotional experiences of our present-day sentimental novel"—there was a tinge of bitterness in her voice—"you find real minds like ours dull and colorless."

"But I don't!"

The sudden energy in the response brought the other to her feet. She

felt herself reddening, and thought wildly, "He must know!"

Herbie subsided suddenly, and muttered in a low voice from which the metallic timber departed almost entirely, "But, of course, I know about it, Dr. Calvin. You think of it always, so how can I help but know."

Her face was hard. "Have you—told anyone?"

"Of course not!" This, with genuine surprise. "No one has asked me."

"Well, then," she flung out, "I suppose you think I'm a fool."

"No! It is a normal emotion."

"Perhaps that's why it's so foolish." The wistfulness in her voice drowned out everything else. Some of the woman peered through the layer of doctorhood. "I am not what you would call—attractive."

"If you are referring to mere physical attraction, I couldn't judge. But I know, in any case, that there are other types of attraction."

"Nor young." Dr. Calvin had scarcely heard the robot.

"You are not yet forty." An anxious insistence had crept into Herbie's voice.

"Thirty-eight as you count the years; a shriveled sixty as far as my emotional outlook on life is concerned. Am I a psychologist for nothing?"

She drove on with bitter breathlessness, "And he's barely thirty and looks and acts younger. Do you suppose he ever sees me as anything but . . . but what I am?"

"You are wrong!" Herbie's steel fist struck the plastic-topped table with a strident clang. "Listen to me—"

BUT Susan Calvin whirled on him now and the hunted pain in her eyes became a blaze, "Why should

I? What do you know about it all, anyway, you . . . you machine. I'm just a specimen to you; an interesting bug with a peculiar mind spread-eagled for inspection. It's a wonderful example of frustration, isn't it? Almost as good as your books." Her voice, emerging in dry sobs, choked into silence.

The robot cowered at the outburst. He shook his head pleadingly. "Won't you listen to me, please? I could help you if you would let me."

"How?" Her lips curled. "By giving me good advice?"

"No, not that. It's just that I know what other people think—Milton Ashe, for instance."

There was a long silence, and Susan Calvin's eyes dropped. "I don't want to know what he thinks," she gasped. "Keep quiet."

"I think you *would* want to know what he thinks."

Her head remained bent, but her breath came more quickly. "You're talking nonsense," she whispered.

"Why should I? I'm trying to help. Milton Ashe's thoughts of you—" he paused.

And then the psychologist raised her head, "Well?"

The robot said quietly, "He loves you."

For a full minute, Dr. Calvin did not speak. She merely stared. Then, "You're mistaken! You must be. Why should he?"

"But he does. A thing like that cannot be hidden—not from me."

"But I am so . . . so—" she stammered to a halt.

"He looks deeper than the skin, and admires intellect in others. Milton Ashe is not the type to marry a head of hair and a pair of eyes."

Susan Calvin found herself blinking rapidly and waited before speak-

ing. Even then her voice trembled, "Yet he certainly never in any way indicated—"

"Have you ever given him a chance?"

"How could I? I never thought that—"

"Exactly!"

The psychologist paused in thought and then looked up suddenly. "A girl visited him here at the plant half a year ago. She was pretty, I suppose—blond and slinky. And, of course, could scarcely add two and two. He spent all day puffing out his chest, trying to explain how a robot was put together." The hardness had returned, "Not that she understood! Who was she?"

Herbie answered without hesitation, "I know the person you're referring to. She's his first cousin, and there is no romantic interest there, I assure you."

Susan Calvin rose to her feet with a vivacity almost girlish, "Now isn't that strange? That's exactly what I used to pretend to myself sometimes, though I never *really* thought so. Then it all must be true."

She ran to Herbie and seized his cold, heavy hand in both hers. "Thank you, Herbie." Her voice was an urgent, husky whisper. "Don't tell anyone about this. Let it be our secret—and thank you again." With that, and a convulsive squeeze of Herbie's unresponsive metal fingers, she left.

Herbie turned slowly to his neglected novel, but there was no one to read *his* thoughts.

MILTON ASHE stretched slowly and magnificently, to the tune of cracking joints and a chorus of grunts, and then glared at Peter Bogert, Ph. D.

"Say," he said, "I've been at this for a week now with just about no

sleep. How long do I have to keep it up? I thought you said the positronic bombardment in Vac Chamber D was the solution."

Bogert yawned delicately and regarded his white hands with interest. "It is! I'm on the track."

"I know what *that* means when a mathematician says it. How near the end are you?"

"It all depends."

"On what?" Ashe dropped into a chair and stretched his long legs out before him.

"On Lanning. The old fellow disagrees with me." He sighed, "A bit behind the times, that's the trouble with him. He clings to matrix mechanics as the all in all, and this problem calls for more powerful mathematical tools. He's so stubborn."

Ashe muttered sleepily, "Why not ask Herbie and settle the whole affair."

"Ask the robot?" Bogert's eyebrows climbed.

"Why not? Didn't the old girl tell you?"

"You mean Calvin?"

"Yeah! Susie herself. That robot's a mathematical wiz. He knows all about everything plus a bit on the side. He does triple integrals in his head and eats up tensor analysis for dessert."

The mathematician stared skeptically. "Are you serious?"

"So help me! The catch is that the dope doesn't like math. He'd rather read slushy novels. Honest! You should see the tripe Susie keeps feeding him: 'Purple Passion' and 'Love in Space.'"

"Dr. Calvin hasn't said a word of it to us."

"Well, she hasn't finished studying him. You know how she is. She likes to have everything just so before letting out the big secret."

"She's told *you*."

"We sort of got to talking. I've been seeing a lot of her lately." He opened his eyes wide and frowned, "Say, Bogie, have you been noticing anything queer about the dame lately?"

Bogert relaxed into an undignified grin, "She's using lipstick, if that's what you mean."

"Hell, I know that. Rouge, powder and eye shadow, too. She's a sight. But it's not that. I can't put my finger on it. It's the way she talks—as if she were happy about something." He thought a little, and then shrugged.

The other allowed himself a leer, which, for a scientist past fifty, was not a bad job, "Maybe she's in love."

Ashe allowed his eyes to close again, "You're nuts, Bogie. You go speak to Herbie; I want to stay here and go to sleep."

"Right! Not that I particularly like having a robot tell me my job, nor that I think he can do it!"

A soft snore was his only answer.

HERBIE LISTENED carefully as Peter Bogert, hands in pockets, spoke with elaborate indifference.

"So there you are. I've been told you understand these things, and I'm asking you more in curiosity than anything else. My line of reasoning, as I've outlined it, involves a few doubtful steps, I admit, which Dr. Lanning refuses to accept, and the picture is still rather incomplete."

The robot didn't answer, and Bogert said, "Well?"

"I see no mistake," Herbie studied the scribbled figures.

"I don't suppose you can go any further than that?"

"I daren't try. You are a better

mathematician than I, and—well, I'd hate to commit myself."

There was a shade of complacency in Bogert's smile, "I rather thought that would be the case. It is deep. We'll forget it." He crumpled the sheets, tossed them down the waste shaft, turned to leave, and then thought better of it.

"By the way—"

The robot waited.

Bogert seemed to have difficulty, "There is something—that is, perhaps you can—" He stopped.

Herbie spoke quietly, "Your thoughts are confused, but there is no doubt at all that they concern Dr. Lanning. It is silly to hesitate, for as soon as you compose yourself, I'll know what it is you want to ask."

The mathematician's hand went to his sleek hair in the familiar smoothing gesture. "Lanning is past seventy," he said, as if that explained everything.

"I know that."

"And he's been director of the plant for almost thirty years."

Herbie nodded.

"Well, now," Bogert's voice became ingratiating, "you would know whether . . . whether he's thinking of resigning. Health, perhaps, or some other—"

"Quite," said Herbie, and that was all.

"Well, do you know?"

"Certainly."

"Then—uh—could you tell me?"

"Since you ask, yes." The robot was quite matter-of-fact about it. "He has already resigned!"

"What!" The exclamation was an explosive, almost inarticulate, sound. The scientist's large head hunched forward, "Say that again!"

"He has already resigned," came the quiet repetition, "but it has not yet taken effect. He is waiting, you

see, to solve the problem of—er—myself. That finished, he is quite ready to turn the office of director over to his successor."

Bogert expelled his breath sharply, "And this successor? Who is he?" He was quite close to Herbie now, eyes fixed fascinatedly on those unreadable dull-red photoelectric cells that were the robot's eyes.

Words came slowly, "You are the next director."

And Bogert relaxed into a tight smile, "This is good to know. I've been hoping and waiting for this. Thanks, Herbie."

He was still smiling as he closed the door behind himself, but what Herbie's feelings were, there was no way of telling.

PETER BOGERT was at his desk until five that morning and he was back at nine. The shelf just over the desk emptied of its row of reference books and tables, as he referred to one after the other. The pages of calculations before him increased microscopically and the crumpled sheets at his feet mounted into a hill of scribbled paper.

At precisely noon, he stared at the final page, rubbed a bloodshot eye, yawned and shrugged. "This is getting worse each minute. Damn!"

He turned at the sound of the opening door and nodded at Lanning, who entered, cracking the knuckles of one gnarled hand with the other.

The director took in the disorder of the room and his eyebrows furrowed together.

"New lead?" he asked.

"No," came the defiant answer. "What's wrong with the old one?"

Lanning did not trouble to answer, nor to do more than bestow a single cursory glance at the top sheet

upon Bogert's desk. He spoke through the flare of a match as he lit a cigar.

"Has Calvin told you about the robot? It's a mathematical genius. Really remarkable."

The other snorted loudly, "So I've heard. But Calvin had better stick to robotics. I've checked Herbie on math, and he can scarcely struggle through calculus."

"Calvin didn't find it so."

"She's crazy."

"And I don't find it so." The director's eyes narrowed dangerously.

"You!" Bogert's voice hardened. "What're you talking about?"

"I've been putting Herbie through his paces all morning, and he can do tricks you never heard of."

"Is that so?"

"You sound skeptical!" Lanning flipped a sheet of paper out of his vest pocket and unfolded it. "That's not my handwriting, is it?"

Bogert studied the large angular notation covering the sheet, "Herbie did this?"

"Right! And if you'll notice, he's been working on your time integration of Equation 22. It comes"—Lanning tapped a yellow fingernail upon the last step—"to the identical conclusion I did, and in a quarter the time. You had no right to neglect the Linger Effect in positronic bombardment."

"I didn't neglect it. For Heaven's sake, Lanning, get it through your head that it would cancel out—"

"Oh, sure, you explained that. You used the Mitchell Translation Equation, didn't you? Well—it doesn't apply."

"Why not?"

"Because you've been using hyper-imaginaries, for one thing."

"What's that to do with it?"

"Mitchell's Equation won't hold when—"

"Are you crazy? If you'll reread Mitchell's original paper in the *Mathematical Journal*—"

"I don't have to. I told you in the beginning that I didn't like his reasoning, and Herbie backs me in that."

"Well, then," Bogert shouted, "let that clockwork contraption solve the entire problem for you. Why bother with nonessentials?"

"That's exactly the point. Herbie can't solve the problem. I've asked him. And if he can't, we can't—alone. I'm submitting the entire question to the National Board. It's gotten beyond us."

Bogert's chair went over backward as he jumped up ashen, face crimson. "You're doing nothing of the sort."

Lanning flushed in his turn, "Are you telling me what I can't do?"

"Exactly," was the gritted response. "I've got the problem beaten and you're not to take it out of my hands, understand? Don't think I don't see through you, you desiccated fossil. You'd cut your own nose off before you'd let me get the credit for solving robotic telepathy."

"You're a damned idiot, Bogert, and in one second I'll have you suspended for insubordination"—Lanning's lower lip trembled with passion.

"Which is one thing you won't do, Lanning. You haven't any secrets with a mind-reading robot around, so don't forget that I know all about your resignation."

The ash on Lanning's cigar trembled and fell, and the cigar itself followed, "What . . . what—"

Bogert chuckled nastily, "And I'm the new director, be it understood. I'm very aware of that; don't think I'm not. Damn your eyes, Lanning, I'm going to give the orders about

here or there will be the sweetest mess that *you've* ever been in."

Lanning found his voice and let it out with a roar. "You're suspended, d'ye hear? You're relieved of all duties. You're broken, do you understand?"

The smile on the other's face broadened, "Now what's the use of that? You're getting nowhere. I'm holding the trumps. I *know* you've resigned. Herbie told me, and he got it straight from you."

Lanning forced himself to speak quietly. He looked an old, old man, with tired eyes peering from a face in which the red had disappeared, leaving the pasty yellow of age behind, "I want to speak to Herbie. He can't have told you anything of the sort. You're playing a deep game, Bogert, but I'm calling your bluff. Come with me."

Bogert shrugged, "To see Herbie? Good! Damned good!"

IT WAS also precisely at noon that Milton Ashe looked up from his clumsy sketch and said, "You get the idea? I'm not too good at getting this down, but that's about how it looks. It's a honey of a house, and I can get it for next to nothing."

Susan Calvin gazed across at him with melting eyes. There had been a preliminary self-consciousness when she had first forced her hair into curls and lacquered her fingernails a bright red—a silly everyone-is-snickering-at-me feeling—but it always vanished when she was with *him*. There was nothing then but the hard, metallic voice of Herbie whispering in her ear—

"It's really beautiful," she sighed. "I've often thought that I'd like to —" Her voice trailed away.

"Of course," Ashe continued briskly, putting away his pencil,

AST—4

"I've got to wait for my vacation. It's only two weeks off, but this Herbie business has everything up in the air." His eyes dropped to his fingernails, "Besides, there's another point—but it's a secret."

"Then don't tell me."

"Oh, I'd just as soon. I'm just busting to tell someone—and you're just about the best—er—confidante I could find here." He grinned sheepishly.

Susan Calvin's heart bounded, but she did not trust herself to speak.

"Frankly," Ashe scraped his chair closer and lowered his voice into a confidential whisper, "the house isn't to be only for myself. I'm getting married!"

And then he jumped out of his seat, "What's the matter?"

"Nothing!" The horrible spinning sensation had vanished, but it was hard to get words out. "Married? You mean—"

"Why, sure! About time, isn't it? You remember that girl who was here last summer. That's she! But you *are* sick. You—"

"Headache!" Susan Calvin motioned him away weakly. "I've . . . I've been subject to them lately. I want to . . . to congratulate you, of course. I'm very glad—" The inexpertly-applied rouge made a pair of nasty red splotches upon her chalk-white face. Things had begun spinning again. "Pardon me—please—"

The words were a mumble, as she stumbled blindly out the door. It had happened with the sudden catastrophe of a dream—and with all the unreal horror of a dream.

But how could it be? Herbie had said—

And Herbie *knew*! He could see into minds!

She found herself leaning breathlessly against the door jamb, staring

into Herbie's metal face. She must have climbed the two flights of stairs, but she had no memory of it. The distance had been covered in an instant, as in a dream.

As in a dream!

And still Herbie's unblinking eyes stared into hers and their dull red seemed to expand into dimly-shining nightmarish globes.

He was speaking, and she felt the cold glass pressing against her lips. She swallowed and shuddered into a certain awareness of her surroundings.

Still Herbie spoke, and there was an agitation in his voice—as if he were hurt and frightened and pleading.

The words were beginning to make sense. "This is a dream," he was saying, "and you mustn't believe in it. You'll wake into the real world soon and laugh at yourself. He loves you, I tell you. He does, he *does*! But not here! Not now! *This* is all illusion."

Susan Calvin nodded, her voice a whisper, "Yes! Yes!" She was clutching Herbie's arm, clinging to it, repeating over and over, "It isn't true, is it? It isn't, is it?"

Just how she came to her senses, she never knew—but it was like passing from a world of misty unreality to one of harsh sunlight. She pushed him away from her, pushed hard against that steely arm, and her eyes were wide.

"What are you trying to do?" Her voice rose to a harsh scream. "*What are you trying to do?*"

Herbie backed away, "I want to help."

The psychologist stared, "Help? By telling me this is a dream? By trying to push me into schizophrenia?" A hysterical tenseness seized her, "This is no dream! I wish it were!"

She drew in her breath sharply, "Wait! Why . . . why, I understand. Merciful heavens, it's so obvious."

There was horror in the robot's voice, "I *had* to!"

"And I *believed* you! I never thought—"

LOUD VOICES outside the door brought her to a halt. She turned away, fists clenching spasmodically, and when Bogert and Lanning entered, she was at the far window. Neither of the men paid her the slightest attention.

They approached Herbie simultaneously; Lanny angry and impatient, Bogert coolly sardonic. The director spoke first.

"Here now, Herbie. Listen to me!"

The robot brought his eyes sharply down upon the aged director, "Yes, Dr. Lanning."

"Have you discussed me with Dr. Bogert?"

"No, sir." The answer came slowly, and the smile on Bogert's face flashed off.

"What's that?" Bogert shoved in ahead of his superior and straddled the ground before the robot. "Repeat what you told me yesterday."

"I said that—" Herbie fell silent. Deep within him his metallic diaphragm vibrated in soft discords. "Didn't you say he had resigned?" roared Bogert. "*Answer me!*"

Bogert raised his arm frantically, but Lanning pushed him aside, "Are you trying to bully him into lying?"

"You heard him, Lanning. He began to say 'Yes' and stopped. Get out of my way! I want the truth out of him, understand!"

"I'll ask him!" Lanning turned to the robot. "All right, Herbie, take it easy. Have I resigned?"

Herbie stared, and Lanning re-

peated anxiously, "Have I resigned?" There was the faintest trace of a negative shake of the robot's head. A long wait produced nothing further.

The two men looked at each other, and the hostility in their eyes was all but tangible.

"What the devil," blurted Bogert, "has the robot gone mute? Can't you speak, you monstrosity?"

"I can speak," came the ready answer.

"Then answer the question. Didn't you tell me Lanning had resigned? *Hasn't he resigned?*"

And again there was nothing but dull silence, until from the end of the room, Susan Calvin's laugh rang out suddenly, high-pitched and semihysterical.

The two mathematicians jumped, and Bogert's eyes narrowed, "You here? What's so funny?"

"Nothin's funny." Her voice was not quite natural. "It's just that I'm not the only one that's been caught. There's irony in three of the greatest experts in robotics in the world falling into the same elementary trap, isn't there?" Her voice faded, and she put a pale hand to her forehead, "But it isn't funny!"

This time the look that passed between the two men was one of raised

eyebrows. "What trap are you talking about?" asked Lanning stiffly. "Is something wrong with Herbie?"

"No," she approached them slowly, "nothin's wrong with *him*—only with us." She whirled suddenly and shrieked at the robot, "Get away from me! Go to the other end of the room and don't let me look at you."

Herbie cringed before the fury of her eyes and stumbled away in a clattering trot.

Lanning's voice was hostile, "What is all this, Dr. Calvin?"

She faced them and spoke wearily, "You know the fundamental law impressed upon the positronic brain of all robots, of course."

The other two nodded together. "Certainly," said Bogert. "On no conditions is a human being to be injured in any way, even when such injury is directly ordered by another human."

"How nicely put," sneered Calvin. "But what kind of injury?"

"Why—any kind." "Exactly! Any kind! But what about hurt feelings? What about deflation of one's ego? What about the blasting of one's hopes? Is that injury?"

Lanning frowned, "What would a

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robot know about—" And then he caught himself with a gasp.

"You've caught on, have you? *This* robot reads minds. Do you suppose it doesn't know everything about mental injury? Do you suppose that if asked a question, it wouldn't give exactly that answer that one *wants* to hear. Wouldn't any other answer hurt us, and wouldn't Herbie know that?"

"Good heavens!" muttered Bogert.

The psychologist cast a sardonic glance at him, "I take it you asked him whether Lanning had resigned. You *wanted* to hear that he had resigned and so that's what Herbie told you."

"And I suppose that is why," said Lanning, tonelessly, "it wouldn't answer a little while ago. It couldn't answer either way without hurting one of us."

THERE WAS a short pause in which the men looked thoughtfully across the room at the robot, crouching in the chair by the bookcase, head resting in one hand.

Susan Calvin stared steadfastly at the floor, "*He* knew of all this. That . . . that devil knows everything—including what went wrong in his assembly." Her eyes were dark and brooding.

Lanning looked up, "You're wrong there, Dr. Calvin. He doesn't know what went wrong. I asked him."

"What does that mean?" cried Calvin. "Only that you didn't want him to give you the solution. It would puncture your ego to have a machine do what you couldn't. Did you ask him?" she shot at Bogert.

"In a way." Bogert coughed and reddened. "He told me he knew very little about mathematics."

Lanning laughed, not very loudly,

and the psychologist smiled caustically. She said, "I'll ask him! A solution by him won't hurt *my* ego." She raised her voice into a cold, imperative "Come here!"

Herbie rose and approached with hesitant steps.

"You know, I suppose," she continued, "just exactly at what point in the assembly an extraneous factor was introduced or an essential one left out."

"Yes," said Herbie, in tones barely heard.

"Hold on," broke in Bogert angrily. "That's not necessarily true. You want to hear that, that's all."

"Don't be a fool," replied Calvin. "He certainly knows as much math as you and Lanning together, since he can read minds. Give him his chance."

The mathematician subsided, and Calvin continued, "All right, then, Herbie, give! We're waiting." And in an aside, "Get pencils and paper, gentlemen."

But Herbie remained silent, and there was triumph in the psychologist's voice, "Why don't you answer, Herbie?"

The robot blurted out suddenly, "I cannot. You know I cannot! Dr. Bogert and Dr. Lanning don't want me to."

"They want the solution."

"But not from me."

Lanning broke in, speaking slowly and distinctly, "Don't be foolish, Herbie. We do want you to tell us."

Bogert nodded curtly.

Herbie's voice rose to wild heights, "What's the use of saying that? Don't you suppose that I can see past the superficial skin of your mind? Down below, you don't want me to. I'm a machine, given the imitation of life only by virtue of the positronic interplay in my brain—which is man's device. You can't

lose face to me without being hurt. That's deep in your mind and *won't* be erased. I *can't* give the solution."

"We'll leave," said Dr. Lanning. "Tell Calvin."

"That would make no difference," cried Herbie, "since you would know anyway that it was I that was supplying the answer."

Calvin resumed, "But you understand, Herbie, that despite that, Drs. Lanning and Bogert want that solution."

"By their own efforts!" insisted Herbie.

"But they want it, and the fact that you have it and won't give it hurts them. You see that, don't you?"

"Yes! Yes!"

"And if you tell them, that will hurt them, too."

"Yes! Yes!" Herbie was retreating slowly, and step by step Susan Calvin advanced. The two men watched in frozen bewilderment.

"You can't tell them," droned the psychologist slowly, "because that would hurt and you mustn't hurt. But if you don't tell them, you hurt, so you *must* tell them. And if you do, you will hurt and you mustn't, so you can't tell them; but if you don't, you hurt, so you must; but if you do, you hurt, so you mustn't; but if you don't, you hurt, so you must; but if you do, you—"

Herbie was up against the wall, and here he dropped to his knees. "Stop!" he shrieked. "Close your mind! It is full of pain and frustration and hate! I didn't mean it, I tell you! I tried to help! I told you what you wanted to hear. I had to!"

The psychologist paid no attention, "You must tell them, but if

you do, you hurt, so you mustn't; but if you don't, you hurt, so you must; but—"

And Herbie screamed!

It was like the whistling of a piccolo many times magnified—shrill and shriller till it keened with the terror of a lost soul and filled the room with the piercingness of itself.

And when it died into nothingness, Herbie collapsed into a huddled heap of motionless metal.

Bogert's face was bloodless, "He's dead!"

"No!" Susan Calvin burst into body-racking gusts of wild laughter, "not dead—merely insane. I confronted him with the insoluble dilemma, and he broke down. You can scrap him now—because he'll never speak again."

Lanning was on his knees beside the thing that had been Herbie. His fingers touched the cold, unresponsive metal face and he shuddered. "You did that on purpose." He rose and faced her, face contorted.

"What if I did? You can't help it now." And in a sudden access of bitterness, "He deserved it."

The director seized the paralyzed, motionless Bogert by the wrist, "What's the difference. Come, Peter." He sighed, "A thinking robot of this type is worthless anyway." His eyes were old and tired, and he repeated, "Come, Pete!"

It was minutes after the two scientists left that Dr. Susan Calvin regained part of her mental equilibrium. Slowly, her eyes turned to the living-dead Herbie and the tight smile returned to her face. Long she stared while the triumph faded and the helpless frustration returned—and of all her turbulent thoughts only one infinitely bitter word passed her lips.

"Liar!"

SOLUTION UNSATISFACTORY

By Anson MacDonald

This story presents a challenge to the reader, a problem that must be solved soon in the world of grim fact if there is any logic in events of history—the problem of the irresistible weapon.

Illustrated by Kramer

IN 1903 the Wright brothers flew at Kitty Hawk.

In December, 1938, in Berlin, Dr. Hahn split the uranium atom.

In April, 1943, Dr. Estelle Karst, working under the Federal Emergency Defense Authority, perfected the Karst-Obre technique for producing artificial radioactives.

So American foreign policy had to change.

Had to. *Had to.* It is very difficult to tuck a bugle call back into a bugle. Pandora's Box is a one-way proposition. You can turn pig into sausage, but not sausage into pig. Broken eggs stay broken. "All the King's horses and all the King's men can't put Humpty together again."

I ought to know—I was one of the King's men.

By rights I should not have been. I was not a professional military man when World War II broke out, and when Congress passed the draft law I drew a high number, high enough to keep me out of the army long enough to die of old age.

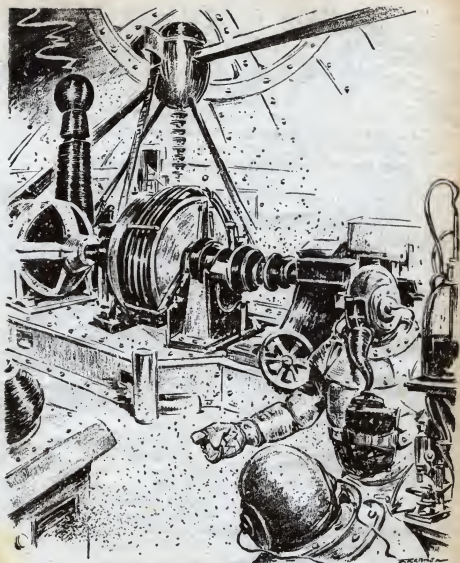
Not that very many died of old age that generation!

But I was the newly appointed secretary to a freshman congressman; I had been his campaign manager and my former job had left me. By profession, I was a high-school teacher of economics and sociology—

school boards don't like teachers of social subjects actually to deal with social problems—and my contract was not renewed. I jumped at the chance to go to Washington.

My congressman was named Manning. Yes, *the* Manning, Colonel Clyde C. Manning, U. S. Army retired—Mr. Commissioner Manning. What you may not know about him is that he was one of the army's No. 1 experts in chemical warfare before a leaky heart put him on the shelf. I had picked him, with the help of a group of my political associates, to run against the two-bit chiseler who was the incumbent in our district. We needed a strong liberal candidate and Manning was tailor-made for the job. He had served one term in the grand jury, which cut his political eye teeth, and had stayed active in civic matters thereafter.

Being a retired army officer was a political advantage in vote-getting among the more conservative and well-to-do citizens, and his record was O. K. for the other side of the fence. I'm not primarily concerned with vote-getting; what I liked about him was that, though he was liberal, he was tough-minded, which most liberals aren't. Most liberals believe that water runs downhill, but, praise God, it'll never reach the bottom.



"The suits protect us—but we can't let that poisonous dust escape into the air."

Manning was not like that. He could see a logical necessity and act on it, no matter how unpleasant it might be.

WE WERE in Manning's suite in the House Office Building, taking a little blow from that stormy first session of the Seventy-eighth Con-

gress and trying to catch up on a mountain of correspondence, when the war department called. Manning answered it himself.

I had to overhear, but then I was his secretary. "Yes," he said, "speaking. Very well, put him on. Oh . . . hello, general. . . . Fine, thanks. Yourself?" Then there was a long

silence. Presently, Manning said, "But I can't do that, general, I've got this job to take care of. . . . What's that? . . . Yes, who is to do my committee work and represent my district? . . . I think so." He glanced at his wrist watch. "I'll be right over."

He put down the phone, turned to me, and said, "Get your hat, John. We are going over to the war department."

"So?" I said, complying.

"Yes," he said with a worried look, "the chief of staff thinks I ought to go back to duty." He set off at a brisk walk, with me hanging back to try to force him not to strain his bum heart. "It's impossible, of course." We grabbed a taxi from the stand in front of the office building, swung around the Capitol, and started down Constitution Boulevard.

But it *was* possible, and Manning agreed to it, after the chief of staff presented his case. Manning had to be convinced, for there is no way on earth for anyone, even the President himself, to order a congressman to leave his post, even though he happens to be a member of the military service, too.

The chief of staff had anticipated the political difficulty and had been forchanded enough to have already dug up an opposition congressman with whom to pair Manning's vote for the duration of the emergency. This other congressman, the Honorable Joseph T. Brigham, was a reserve officer who wanted to go to duty himself—or was willing to; I never found out which. Being from the opposite political party, his vote in the House of Representatives could be permanently paired against Manning's and neither party would lose by the arrangement.

There was talk of leaving me in Washington to handle the political details of Manning's office, but Manning decided against it, judging that his other secretary could do that, and announced that I must go along as his adjutant. The chief of staff demurred, but Manning was in a position to insist, and the chief had to give in.

A chief of staff can get things done in a hurry if he wants to. I was sworn in as a temporary officer before we left the building; before the day was out I was at the bank, signing a note to pay for the sloppy service uniforms the army had adopted and to buy a dress uniform with a beautiful shiny belt—a dress outfit which, as it turned out, I was never to need.

WE DROVE over into Maryland the next day and Manning took charge of the Federal nuclear research laboratory, known officially by the hush-hush title of War Department Special Defense Project No. 347. I didn't know a lot about physics and nothing about modern atomic physics, aside from the stuff you read in the Sunday supplements. Later, I picked up a smattering, mostly wrong, I suppose, from associating with the heavyweights with which the laboratory was staffed.

Colonel Manning had taken an army p. g. course at Massachusetts Tech and had received a master of science degree for a brilliant thesis on the mathematical theories of atomic structure. That was why the army had to have him for this job. But that had been some years before; atomic theory had turned several cartwheels in the meantime; he admitted to me that he had to bone like the very devil to try to catch up to the point where he could begin to understand what his highbrow

charges were talking about in their reports.

I think he overstated the degree of his ignorance; there was certainly no one else in the United States who could have done the job. It required a man who could direct and suggest research in a highly esoteric field, but who saw the problem from the standpoint of urgent military necessity. Left to themselves, the physicists would have reveled in the intellectual luxury of an unlimited research expense account, but, while they undoubtedly would have made major advances in human knowledge, they might never have developed anything of military usefulness, or the military possibilities of a discovery might be missed for years.

It's like this: It takes a smart hound dog to hunt birds, but it takes a hunter behind him to keep him from wasting time chasing rabbits. And the hunter needs to know nearly as much as the dog.

No derogatory reference to the scientists is intended—by no means! We had all the genius in the field that the United States could produce, men from Chicago, Columbia, Cornell, M. I. T., Cal Tech, Berkley, every radiation laboratory in the country, as well as a couple of broad-A boys lent to us by the British. And they had every facility that ingenuity could think up and money could build. The five-hundred-ton cyclotron which had originally been intended for the University of California was there, and was already obsolete in the face of the new gadgets these brains had thought up, asked for, and been given. Canada supplied us with all the uranium we asked for—tons of the treacherous stuff—from Great Bear Lake, up near the Yukon, and the fractional-residues technique of separating uranium isotope 235 from

the commoner isotope 238 had already been worked out, by the same team from Chicago that had worked up the earlier expensive mass spectrograph method.

Someone in the United States government had realized the terrific potentialities of uranium 235 quite early and, as far back as the summer of 1940, had rounded up every atomic research man in the country and had sworn them to silence. Atomic power, if ever developed, was planned to be a government monopoly, at least till the war was over. It might turn out to be the most incredibly powerful explosive ever dreamed of, and it might be the source of equally incredible power. In any case, with Hitler talking about secret weapons and shouting hoarse insults at democracies, the government planned to keep any new discoveries very close to the vest.

Hitler had lost the advantage of a first crack at the secret of uranium through not taking precautions. Dr. Hahn, the first man to break open the uranium atom, was a German. But one of his laboratory assistants had fled Germany to escape a pogrom. She came to this country, and told us about it.

We were searching, there in the laboratory in Maryland, for a way to use U235 in a controlled explosion. We had a vision of a one-ton bomb that would be a whole air raid in itself, a single explosion that would flatten out an entire industrial center. Dr. Ridpath, of Continental Tech, claimed that he could build such a bomb, but that he could not guarantee that it would not explode as soon as it was loaded and as for the force of the explosion—well, he did not believe his own figures; they ran out to too many ciphers.

The problem was, strangely

enough, to find an explosive which would be weak enough to blow up only one county at a time, and stable enough to blow up only on request. If we could devise a really practical rocket fuel at the same time, one capable of driving a war rocket at a thousand miles an hour, or more, then we would be in a position to make most anybody say "uncle" to Uncle Sam.

We fiddled around with it all the rest of 1943 and well into 1944. The war in Europe and the troubles in Asia dragged on. After Italy folded up, England was able to release enough ships from her Mediterranean fleet to ease the blockade of the British Isles. With the help of the planes we could now send her regularly and with the additional over-age destroyers we let her have, England hung on somehow, digging in and taking more and more of her essential defense industries underground. Russia shifted her weight from side to side as usual, apparently with the policy of preventing either side from getting a sufficient advantage to bring the war to a successful conclusion. People were beginning to speak of "permanent war."

I WAS killing time in the administrative office, trying to improve my typing—a lot of Manning's reports had to be typed by me personally—when the orderly on duty stepped in and announced Dr. Karst. I flipped the interoffice communicator. "Dr. Karst is here, chief. Can you see her?"

"Yes," he answered, through his end.

I told the orderly to show her in.

Estelle Karst was quite a remarkable old girl and, I suppose, the first woman ever to hold a commission in the corps of engineers. She was an M. D. as well as an Sc.D. and re-

minded me of the teacher I had had in fourth grade. I guess that was why I always stood up instinctively when she came in the room—I was afraid she might look at me and sniff. It couldn't have been her rank; we didn't bother much with rank.

She was dressed in white coveralls and a shop apron and had simply thrown a hooded cape over herself to come through the snow. I said, "Good morning, ma'am," and led her into Manning's office.

The colonel greeted her with the urbanity that had made him such a success with women's clubs, seated her, and offered her a cigarette.

"I'm glad to see you, major," he said. "I've been intending to drop around to your shop."

I knew what he was getting at; Dr. Karst's work had been primarily physiomedical; he wanted her to change the direction of her research to something more productive in a military sense.

"Don't call me 'major,'" she said tartly.

"Sorry doctor—"

"I came on business, and must get right back. And I presume you are a busy man, too. Colonel Manning, I need some help."

"That's what we are here for."

"Good. I've run into some snags in my research. I think that one of the men in Dr. Ridpath's department could help me, but Dr. Ridpath doesn't seem disposed to be co-operative."

"So? Well, I hardly like to go over the head of a departmental chief, but tell me about it; perhaps we can arrange it. Whom do you want?"

"I need Dr. Obre."

"The spectroscopist—hm-m-m. I can understand Dr. Ridpath's reluctance, Dr. Karst, and I'm dis-

posed to agree with him. After all, the high-explosives research is really our main show around here."

She bristled and I thought she was going to make him stay in after school at the very least. "Colonel Manning, do you realize the importance of artificial radioactives to modern medicine?"

"Why, I believe I do. Nevertheless, doctor, our primary mission is to perfect a weapon which will serve as a safeguard to the whole country in time of war—"

She sniffed and went into action. "Weapons—fiddlesticks! Isn't there a medical corps in the army? Isn't it more important to know how to heal men than to know how to blow them to bits? Colonel Manning, you're not a fit man to have charge of this project! You're a . . . you're a, a warmonger, that's what you are!"

I felt my ears turning red, but Manning never budged. He could have raised Cain with her, confined her to her quarters, maybe even have court-martialed her, but Manning isn't like that. He told me once that every time a man is court-martialed, it is a sure sign that some senior officer hasn't measured up to his job.

"I am sorry you feel that way, doctor," he said mildly, "and I agree that my technical knowledge isn't what it might be. And, believe me, I do wish that healing were all we had to worry about. In any case, I have not refused your request. Let's walk over to your laboratory and see what the problem is. Likely there is some arrangement that can be made which will satisfy everybody."

He was already up and getting out his greatcoat. Her set mouth relaxed a trifle and she answered, "Very well. I'm sorry I spoke as I did."

"Not at all," he replied. "These are worrying times. Come along, John."

I trailed after them, stopping in the outer office to get my own coat and to stuff my notebook in a pocket.

By the time we had trudged through mushy snow the eighth of a mile to her lab they were talking about gardening!

MANNING acknowledged the sentry's challenge with a wave of his hand and we entered the building. He started casually on into the inner lab, but Karst stopped him. "Armor first, colonel."

We had trouble finding overshoes that would fit over Manning's boots, which he persisted in wearing, despite the new uniform regulations, and he wanted to omit the foot protection, but Karst would not hear of it. She called in a couple of her assistants who made jury-rigged moccasins out of some soft-lead sheeting.

The helmets were different from those used in the explosives lab, being fitted with inhalers. "What's this?" inquired Manning.

"Radioactive dust guard," she said. "It's absolutely essential."

We threaded a lead-lined meander and arrived at the workroom door which she opened by combination. I blinked at the sudden bright illumination and noticed that the air was filled with little shiny motes.

"Hm-m-m—it is dusty," agreed Manning. "Isn't there some way of controlling that?" His voice sounded muffled from behind the dust mask.

"The last stage has to be exposed to air," explained Karst. "The hood gets most of it. We could control it, but it would mean a quite expensive new installation."

"No trouble about that. We're

not on a budget, you know. It must be very annoying to have to work in a mask like this."

"It is," acknowledged Karst. "The kind of gear it would take would enable us to work without body armor, too. That would be a comfort."

I suddenly had a picture of the kind of thing these researchers put up with. I am a fair-sized man, yet I found that armor heavy to carry around. Estelle Karst was a small woman, yet she was willing to work maybe fourteen hours, day after day, in an outfit which was about as comfortable as a diving suit. But she had not complained.

Not all the heroes are in the headlines. These radiation experts not only ran the chance of cancer and nasty radioaction burns, but the men stood a chance of damaging their germ plasm and then having their wives present them with something horrid in the way of offspring—no chin, for example, and long hairy ears. Nevertheless, they went right ahead and never seemed to get irritated unless something held up their work.

Dr. Karst was past the age when she would be likely to be concerned personally about progeny, but the principle applies.

I wandered around, looking at the unlikely apparatus she used to get her results, fascinated as always by my failure to recognize much that reminded me of the physics laboratory I had known when I was an undergraduate, and being careful not to touch anything. Karst started explaining to Manning what she was doing and why, but I knew that it was useless for me to try to follow that technical stuff. If Manning wanted notes, he would dictate them. My attention was caught by a big boxlike contraption in one corner of the room. It had a hopperlike

gadget on one side and I could hear a sound from it like the whirring of a fan with a background of running water. It intrigued me.

I moved back to the neighborhood of Dr. Karst and the colonel and heard her saying, "The problem amounts to this, colonel: I am getting a much more highly radioactive end-product than I want, but there is considerable variation in the half-life of otherwise equivalent samples. That suggests to me that I am using a mixture of isotopes, but I haven't been able to prove it. And frankly, I do not know enough about that end of the field to be sure of sufficient refinement in my methods. I need Dr. Obre's help on that."

I think those were her words, but I may not be doing her justice, not being a physicist. I understood the part about "half-life." All radioactive materials keep right on radiating until they turn into something else, which takes theoretically forever. As a matter of practice their periods, or "lives," are described in terms of how long it takes the original radiation to drop to one-half strength. That time is called a "half-life" and each radioactive isotope of an element has its own specific characteristic half-lifetime.

One of the staff—I forget which one—told me once that *any* form of matter can be considered as radioactive in some degree; it's a question of intensity and period, or half-life.

"I'll talk to Dr. Ridpath," Manning answered her, "and see what can be arranged. In the meantime you might draw up plans for what you want to re-equip your laboratory."

"Thank you, colonel."

I COULD SEE that Manning was about ready to leave, having pacified her; I was still curious about the

big box that gave out the odd noises.

"May I ask what that is, doctor?"

I said, pointing.

"Oh, that? That's an air conditioner."

"Odd-looking one. I've never seen one like it."

"It's not to condition the air for this room. It's to remove the radioactive dust before the exhaust air goes outdoors. We wash the dust out of the foul air."

"Where does the water go?"

"Down the drain. Out into the bay eventually, I suppose."

I tried to snap my fingers, which was impossible because of the lead mittens. "That accounts for it, colonel!"

"Accounts for what?"

"Accounts for those accusing notes we've been getting from the Bureau of Fisheries. This poisonous dust is being carried out into Chesapeake Bay and is killing the fish."

Manning turned to Karst. "Do you think that possible, doctor?"

I could see her brows draw together through the window in her helmet. "I hadn't thought about it," she admitted. "I'd have to do some figuring on the possible concentrations before I could give you a definite answer. But it is possible—yes. However," she added anxiously, "it would be simple enough to divert this drain to a sink hole of some sort."

"Hm-m—yes." He did not say anything for some minutes, simply stood there, looking at the box.

Presently he said, "This dust is pretty lethal?"

"Quite lethal, colonel." There was another long silence.

At last I gathered he had made up his mind about something for he said decisively, "I am going to see to it that you get Obre's assistance, doctor—"

"Oh, good!"

"—but I want you to help me in return. I am very much interested in this research of yours, but I want it carried on with a little broader scope. I want you to investigate for maxima both in period and intensity as well as for minima. I want you to drop the strictly utilitarian approach and make an exhaustive research along lines which we will work out in greater detail later."

She started to say something but he cut in ahead of her. "A really thorough program of research should prove more helpful in the long run to your original purpose than a more narrow one. And I shall make it my business to expedite every possible facility for such a research. I think we may turn up a number of interesting things."

He left immediately, giving her no time to discuss it. He did not seem to want to talk on the way back and I held my peace. I think he had already gotten a glimmering of the bold and drastic strategy this was to lead to, but even Manning could not have thought out that early the inescapable consequences of a few dead fish—otherwise he would never have ordered the research.

No, I don't really believe that. He would have gone right ahead, knowing that if he did not do it, someone else would. He would have accepted the responsibility while bitterly aware of its weight.

1944 WORE ALONG with no great excitement on the surface. Karst got her new laboratory equipment and so much additional help that her department rapidly became the largest on the grounds. The explosives research was suspended after a conference between Manning and Ridpath, of which I heard only the end, but the meat of it was that there

existed not even a remote possibility at that time of utilizing U235 as an explosive. As a source of power, yes, sometime in the distant future when there had been more opportunity to deal with the extremely ticklish problem of controlling the nuclear reaction. Even then it seemed likely that it would not be a source of power in prime movers such as rocket motors or mobiles, but would be used in vast power plants at least as large as the Boulder Dam installation.

After that Ridpath became a sort of co-chairman of Karst's department and the equipment formerly used by the explosives department was adapted or replaced to carry on research on the deadly artificial radioactives. Manning arranged a division of labor and Karst stuck to her original problem of developing techniques for tailor-making radioactives. I think she was perfectly happy, sticking with a one-track mind to the problem at hand. I don't know to this day whether or not Manning and Ridpath ever saw fit to discuss with her what they intended to do.

As a matter of fact, I was too busy myself to think much about it. The general elections were coming up and I was determined that Manning should have a constituency to return to, when the emergency was over. He was not much interested, but agreed to let his name be filed as a candidate for re-election. I was trying to work up a campaign by remote control and cursing because I could not be in the field to deal with the thousand and one emergencies as they arose.

I did the next best thing and had a private line installed to permit the campaign chairman to reach me easily. I don't think I violated the Hatch Act, but I guess I stretched it

a little. Anyhow, it turned out all right; Manning was elected, as were several other members of the citizen-military that year. An attempt was made to smear him by claiming that he was taking two salaries for one job, but we squelched that with a pamphlet entitled "For Shame!" which explained that he got *one* salary for *two* jobs. That's the Federal law in such cases and people are entitled to know it.

IT WAS just before Christmas that Manning first admitted to me how much the implications of the Karst-Obre process were preying on his mind. He called me into his office over some inconsequential matter, then did not let me go. I saw that he wanted to talk.

"How much of the K-O dust do we now have on hand?" he asked suddenly.

"Just short of ten thousand units," I replied. "I can look up the exact figures in half a moment." A unit would take care of a thousand men, at normal dispersion. He knew the figure as well as I did, and I knew he was stalling.

We had shifted almost imperceptibly from research to manufacture, entirely on Manning's initiative and authority. Manning had never made a specific report to the department about it, unless he had done so verbally to the chief of staff.

"Never mind," he answered to my suggestion, then added, "Did you see those horses?"

"Yes," I said briefly.

I did not want to talk about it, I like horses. We had requisitioned six broken-down old nags, ready for the bone yard, and had used them experimentally. We knew now what the dust would do. After they had died, any part of their carcasses would register on a photographic

plate and tissue from the apices of their lungs and from the bronchia glowed with a light of its own.

Manning stood at the window, staring out at the dreary Maryland winter for a minute or two before replying, "John, I wish that radioactivity had never been discovered. Do you realize what that devilish stuff amounts to?"

"Well," I said, "it's a weapon, about like poison gas—maybe more efficient."

"Rats!" he said, and for a moment I thought he was annoyed with me personally. "That's about like comparing a sixteen-inch gun with a bow and arrow. We've got here the first weapon the world has ever seen against which there is no defense, none whatsoever. It's death itself, C. O. D."

"Have you seen Ridpath's report?" he went on.

I had not. Ridpath had taken to delivering his reports by hand to Manning personally.

"Well," he said, "ever since we started production I've had all the talent we could spare working on the problem of a defense against the dust. Ridpath tells me and I agree with him that there is no means whatsoever to combat the stuff, once it's used."

"How about armor," I asked, "and protective clothing?"

"Sure, sure," he agreed irritably, "provided you never take it off to eat, or to drink, or for any purpose whatever, until the radioaction has ceased, or you are out of the danger zone. That is all right for laboratory work; I'm talking about war."

I considered the matter. "I still don't see what you are fretting about, colonel. If the stuff is as good as you say it is, you've done just exactly what you set out to do—develop a weapon which would

give the United States protection against aggression."

He swung around. "John, there are times when I think you are downright stupid!"

I said nothing. I knew him and I knew how to discount his moods. The fact that he permitted me to see his feelings is the finest compliment I have ever had.

"Look at it this way," he went on more patiently, "this dust, as a weapon, is not just simply sufficient to safeguard the United States, it amounts to a loaded gun held at the head of every man, woman, and child on the globe!"

"Well," I answered, "what of that? It's our secret, and we've got the upper hand. The United States can put a stop to this war, and any other war. We can declare a *Pax Americana*, and enforce it."

"Hm-m-m—I wish it were that easy. But it won't remain our secret; you can count on that. It doesn't matter how successfully we guard it; all that anyone needs is the hint given by the dust itself and then it is just a matter of time until some other nation develops a technique to produce it. You can't stop brains from working, John; the re-invention of the method is a mathematical certainty, once they know what it is they are looking for. And uranium is a common enough substance, widely distributed over the globe—don't forget that!"

"It's like this: Once the secret is out—and it will be out if we ever use the stuff!—the whole world will be comparable to a room full of men, each armed with a loaded .45. They can't get out of the room and each one is dependent on the good will of every other one to stay alive. All offense and no defense. See what I mean?"

I thought about it, but I still

didn't guess at the difficulties. It seemed to me that a peace enforced by us was the only way out, with precautions taken to see that we controlled the sources of uranium. I had the usual American subconscious conviction that our country would never use power in sheer aggression. Later, I thought about the Mexican War and the Spanish-American War and some of the things we did in Central America, and I was not so sure—

IT WAS a couple of weeks later, shortly after inauguration day, that Manning told me to get the chief of staff's office on the telephone. I heard only the tail end of the conversation. "No, general, I won't," Manning was saying, "I won't discuss it with you, or the secretary, either. This is a matter the commander in chief is going to have to decide in the long run. If he turns it down, it is imperative that no one else ever knows about it. That's my considered opinion. . . . What's that? . . . I took this job under the condition that I was to have a free hand. You've got to give me a little leeway this time. . . . Don't go brass hat on me. I knew you when you were a plebe. . . . O. K., O. K., sorry. . . . If the secretary of war won't listen to reason, you tell him I'll be in my seat in the House of Representatives tomorrow, and that I'll get the favor I want from the majority leader. . . . All right. Good-bye."

Washington rang up again about an hour later. It was the secretary of war. This time Manning listened more than he talked. Toward the end, he said, "All I want is thirty minutes alone with the President. If nothing comes of it, no harm has been done. If I convince him, then you will know all about it. . . . No, sir, I have no desire to embarrass

you. If you prefer, I can have myself announced as a congressman; then you won't be responsible. . . . No, sir, I did not mean that you would avoid responsibility. I intended to be helpful. . . . Fine! Thank you, Mr. Secretary."

The White House rang up later in the day and set a time.

WE DROVE DOWN to the district the next day through a nasty cold rain that threatened to turn to sleet. The usual congestion in Washington was made worse by the weather; it very nearly caused us to be late in arriving. I could hear Manning swearing under his breath all the way down Rhode Island Avenue. But we were dropped at the west wing entrance to the White House with two minutes to spare. Manning was ushered into the oval office almost at once and I was left cooling my heels and trying to get comfortable in civilian clothes. After so many months of uniform they itched in the wrong places.

The thirty minutes went by.

The President's reception secretary went in, and came out very promptly indeed. He stepped on out into the outer reception room and I heard something that began with, "I'm sorry, senator, but—" He came back in, made a penciled notation, and passed it out to an usher.

Two more hours went by.

Manning appeared at the door at last and the secretary looked relieved. But he did not come out, saying instead, "Come in, John. The President wants to take a look at you."

I fell over my feet getting up.

Manning said, "Mr. President, this is Captain deFries." The President nodded, and I bowed, unable to say anything. He was standing on the hearth rug, his fine head turned to-

ward us, and looking just like his pictures—but it seemed strange for the President of the United States not to be a tall man.

I had never seen him before, though, of course, I knew something of his record the two years he had been in the Senate and while he was mayor before that.

The President said, "Sit down, deFries. Care to smoke?" Then to Manning, "You think he can do it?"

"I think he'll have to. It's Hobson's choice."

"And you are sure of him?"

"He was my campaign manager."

"I see."

The President said nothing more for a while and God knows I didn't!—though I was bursting to know what they were talking about. He commenced again, with, "Colonel Manning, I intend to follow the procedure you have suggested, with the changes we discussed. But I will be down tomorrow to see for myself that the dust will do what you say it will. Can you prepare a demonstration?"

"Yes, Mr. President."

"Very well. We will use Captain deFries unless I think of a better procedure." I thought for a moment that they planned to use me for a guinea pig! But he turned to me and continued, "Captain, I expect to send you to England as my representative."

I gulped. "Yes, Mr. President." And that is every word I had to say in calling on the President of the United States."

AFTER THAT, Manning had to tell me a lot of things he had on his mind. I am going to try to relate them as carefully as possible, even at the risk of being dull and obvious and of repeating things that are common knowledge.

We had a weapon that could not be stopped. Any type of K-O dust, scattered over an area rendered that area uninhabitable for a length of time that depended on the half-life of the radioactivity.

Period. Full stop.

Once an area was dusted there was nothing that could be done about it until the radioactivity had fallen off to the point where it was no longer harmful. The dust could not be cleaned out; it was everywhere. There was no possible way to counteract it—burn it, combine it chemically; the radioactive isotope was still there, still radioactive, still deadly. Once used on a stretch of land, for a predetermined length of time that piece of earth *would not tolerate life*.

It was extremely simple to use. No complicated bombsights were needed, no care need be taken to hit "military objectives." Take it aloft in any sort of aircraft, attain a position more or less over the area you wish to sterilize, and drop the stuff. Those on the ground in the contaminated area are dead men, dead in an hour, a day, a week, a month, depending on the degree of the infection—but *dead*.

Manning told me that he had once seriously considered, in the middle of the night, recommending that every single person, including himself, who knew the Karst-Obre technique be put to death, in the interests of all civilization. But he had realized the next day that it had been sheer funk; the technique was certain in time to be rediscovered by someone else.

Furthermore, it would not do to wait, to refrain from using the grisly power, until someone else perfected it and used it. The only possible chance to keep the world from being turned into one huge morgue was for

us to use the power first and drastically—get the upper hand and keep it.

We were not at war, legally, yet we had been in the war up to our necks with our weight on the side of democracy since 1940. Manning had proposed to the President that we turn a supply of the dust over to Great Britain, under conditions we specified, and enable them thereby to force a peace. But the terms of the peace would be dictated by the United States—for we were not turning over the secret.

After that, the *Pax Americana*.

The United States was having power thrust on it, willy-nilly. We had to accept it and enforce a worldwide peace, ruthlessly and drastically, or it would be seized by some other nation. There could not be coequals in the possession of this weapon. The factor of time predominated.

I was selected to handle the details in England because Manning insisted, and the President agreed with him, that every person technically acquainted with the Karst-Obre process should remain on the laboratory reservation in what

amounted to protective custody—imprisonment. That included Manning himself. I could go because I did not have the secret—I could not even have acquired it without years of schooling—and what I did not know I could not tell, even under, well, drugs. We were determined to keep the secret as long as we could to consolidate the *pax*; we did not distrust our English cousins, but they were Britishers, with a first loyalty to the British Empire. No need to tempt them.

I was picked because I understood the background if not the science, and because Manning trusted me. I don't know why the President trusted me, too, but then my job was not complicated.

WE TOOK OFF from the new field outside Baltimore on a cold, raw afternoon which matched my own feelings. I had an all-gone feeling in my stomach, a runny nose, and, buttoned inside my clothes, papers appointing me a special agent of the President of the United States. They were odd papers, papers without precedent; they did not simply give me the usual diplomatic im-



munity; they made my person very nearly as sacred as that of the President himself.

At Nova Scotia we touched ground to refuel, the F. B. I. men left us, we took off again, and the Canadian transfigters took their stations around us. All the dust we were sending was in my plane; if the President's representative were shot down, the dust would go to the bottom with him.

No need to tell of the crossing. I was airsick and miserable, in spite of the steadiness of the new six-engined jobs. I felt like a hangman on the way to an execution, and wished to God that I were a boy again, with nothing more momentous than a debate contest, or a track meet, to worry me.

There was some fighting around us as we neared Scotland, I know, but I could not see it, the cabin being shuttered. Our pilot-captain ignored it and brought his ship down on a totally dark field, using a beam, I suppose, though I did not know nor care. I would have welcomed a crash. Then the lights outside went on and I saw that we had come to rest in an underground hangar.

I stayed in the ship. The commandant came to see me and expected me to come to his quarters as his guest. I shook my head. "I stay here," I said. "Orders. You are to treat this ship as United States soil, you know."

He seemed miffed, but compromised by having dinner served for both of us in my ship.

There was a really embarrassing situation the next day. I was commanded to appear for a royal audience. But I had my instructions and I stuck to them. I was sitting on that cargo of dust until the President told me what to do with it. Late in the day I was called on by

a member of Parliament—nobody admitted out loud that it was the Prime Minister—and a Mr. Wind-sor. The M. P. did most of the talking and I answered his questions. My other guest said very little and spoke slowly with some difficulty. But I got a very favorable impression of him. He seemed to be a man who was carrying a load beyond human strength and carrying it heroically.

THERE FOLLOWED the longest period in my life. It was actually only a little longer than a week, but every minute of it had that split-second intensity of imminent disaster that comes just before a car crash. The President was using the time to try to avert the need to use the dust. He had two face-to-face television conferences with the new Fuehrer. The President spoke German fluently, which should have helped. He spoke three times to the warring peoples themselves, but it is doubtful if very many on the continent were able to listen, the police regulations there being what they were.

The ambassador for the Reich was given a special demonstration of the effect of the dust. He was flown out over a deserted stretch of Western prairie and allowed to see what a single dusting would do to a herd of steers. It should have impressed him and I think that it did—*nobody* could ignore a visual demonstration!—but what report he made to his leader we never knew.

The British Isles were visited repeatedly during the wait by bombing attacks as heavy as any of the war. I was safe enough but I heard about them, and I could see the effect on the morale of the officers with whom I associated. Not that it frightened them—it made them coldly angry. The raids were not

directed primarily at dockyards or factories, but were ruthless destruction of anything, particularly villages.

"I don't see what you chaps are waiting for," a flight commander complained to me. "What the Jerries need is a dose of their own *shrecklichkeit*, a lesson in their own Aryan culture."

I shook my head. "We'll have to do it our own way."

He dropped the matter, but I knew how he and his brother officers felt. They had a standing toast, as sacred as the toast to the King: "Remember Coventry!"

Our President had stipulated that the R. A. F. was not to bomb during the period of negotiation, but their bombers were busy nevertheless. The continent was showered, night after night, with bales of leaflets, prepared by our own propaganda agents. The first of these called on the people of the Reich to stop a useless war and promised that the terms of peace would not be vindictive. The second rain of pamphlets showed photographs of that herd of steers. The third was a simple direct warning to get out of cities and to stay out.

As Manning put it, we were calling "Halt!" three times before firing. I do not think that he or the President expected it to work, but we were morally obligated to try.

The Britishers had installed for me a televisor, of the Simonds-Yarley nonintercept type, the sort whereby the receiver must "trigger" the transmitter in order for transmission to take place at all. It made assurance of privacy in diplomatic rapid communication for the first time in history, and was a real help in the crisis. I had brought along my own technician, one of the

F. B. I.'s new corps of specialists, to handle the scrambler and the trigger.

He called to me one afternoon. "Washington signaling."

I climbed tiredly out of the cabin and down to the booth on the hangar floor, wondering if it were another false alarm.

It was the President. His lips were white. "Carry out your basic instructions, Mr. deFries."

"Yes, Mr. President!"

THE DETAILS had been worked out in advance and, once I had accepted a receipt and token payment from the commandant for the dust, my duties were finished. But, at our instance, the British had invited military observers from every independent nation and from the several provisional governments of occupied nations. The United States ambassador designated me as one at the request of Manning.

Our task group was thirteen bombers. One such bomber could have carried all the dust needed, but it was split up to insure most of it, at least, reaching its destination. I had fetched forty percent more dust than Ridpath calculated would be needed for the mission and my last job was to see to it that every canister actually went on board a plane of the flight. The extremely small weight of dust used was emphasized to each of the military observers.

We took off just at dark, climbed to twenty-five thousand feet, refueled in the air, and climbed again. Our escort was waiting for us, having refueled thirty minutes before us. The flight split into thirteen groups, and cut the thin air for middle Europe. The bombers we rode had been stripped and hiked up to permit the utmost maximum of speed and altitude.

Elsewhere in England, other flights

had taken off shortly before us to act as a diversion. Their destinations were every part of Germany; it was the intention to create such confusion in the air above the Reich that our few planes actually engaged in the serious work might well escape attention entirely, flying so high in the stratosphere.

The thirteen dust carriers approached Berlin from different directions, planning to cross Berlin as if following the spokes of a wheel. The night was appreciably clear and we had a low moon to help us. Berlin is not a hard city to locate, since it has the largest square-mile area of any modern city and is located on a broad flat alluvial plain. I could make out the River Spree as we approached it, and the Havel. The city was blacked out, but a city makes a different sort of black from open country. Parachute flares hung over the city in many places, showing that the R. A. F. had been busy before we got there and the A. A. batteries on the ground helped to pick out the city.

There was fighting below us, but not within fifteen thousand feet of our altitude as nearly as I could judge.

The pilot reported to the captain, "On line of bearing!" The chap working the absolute altimeter steadily fed his data into the fuse pots of the canister. The canisters were equipped with a light charge of black powder, sufficient to explode them and scatter the dust at a time after release predetermined by the fuse pot setting. The method used was no more than an efficient expedient. The dust would have been almost as effective had it simply been dumped out in paper bags, although not as well distributed.

The captain hung over the navigator's board, a slight frown on his thin

sallow face. "Ready one!" reported the bomber.

"Release!"

"Ready two!"

The captain studied his wrist watch. "Release!"

"Ready three!"

"Release!"

When the last of our ten little packages was out of the ship we turned tail and ran for home.

NO ARRANGEMENTS had been made for me to get home; nobody had thought about it. But it was the one thing I wanted to do. I did not feel badly; I did not feel much of anything. I felt like a man who has at last screwed up his courage and undergone a serious operation; it's over now, he is still numb from shock but his mind is relaxed. But I wanted to go home.

The British commandant was quite decent about it; he serviced and manned my ship at once and gave me an escort for the offshore war zone. It was an expensive way to send one man home, but who cared? We had just expended some millions of lives in a desperate attempt to end the war; what was a money expense? He gave the necessary orders absentmindedly.

I took a double dose of nembital and woke up in Canada. I tried to get some news while the plane was being serviced, but there was not much to be had. The government of the Reich had issued one official news bulletin shortly after the raid, sneering at the much vaunted "secret weapon" of the British and stating that a major air attack had been made on Berlin and several other cities, but that the raiders had been driven off with only minor damage. The current Lord Haw-Haw started one of his sarcastic speeches but was unable to continue it. The an-

nouncer said that he had been seized with a heart attack, and substituted some recordings of patriotic music. The station cut off in the middle of the "Horst Wessel" song. After that there was silence.

I managed to promote an army car and a driver at the Baltimore field which made short work of the Annapolis speedway. We almost overran the turnoff to the laboratory.

Manning was in his office. He looked up as I came in, said, "Hello, John," in a dispirited voice, and dropped his eyes again to the blotter pad. He went back to drawing doodles.

I looked him over and realized for the first time that the chief was an old man. His face was gray and flabby, deep furrows framed his mouth in a triangle. His clothes did not fit.

I went up to him and put a hand on his shoulder. "Don't take it so hard, chief. It's not your fault. We gave them all the warning in the world."

He looked up again. "Estelle Karst suicided this morning."

Anybody could have anticipated it, but nobody did. And somehow I felt harder hit by her death than by the death of all those strangers in Berlin. "How did she do it?" I asked.

"Dust. She went into the canning room, and took off her armor."

I could picture her—head held high, eyes snapping, and that set look on her mouth which she got when people did something she disapproved of. One little old woman whose lifetime work had been turned against her.

"I wish," Manning added slowly, "that I could explain to her why we had to do it."

We buried her in a lead-lined cof-

fin, then Manning and I went on to Washington.

WHILE we were there, we saw the motion pictures that had been made of the death of Berlin. You have not seen them; they never were made public, but they were of great use in convincing the other nations of the world that peace was a good idea. I saw them when Congress did, being allowed in because I was Manning's assistant.

They had been made by a pair of R. A. F. pilots, who had dodged the *Luftwaffe* to get them. The first shots showed some of the main streets the morning after the raid. There was not much to see that would show up in telephoto shots, just busy and crowded streets, but if you looked closely you could see that there had been an excessive number of automobile accidents.

The second day showed the attempt to evacuate. The inner squares of the city were practically deserted save for bodies and wrecked cars, but the streets leading out of town were boiling with people, mostly on foot, for the trams were out of service. The pitiful creatures were fleeing, not knowing that death was already lodged inside them. The plane swooped down at one point and the cinematographer had his telephoto lens pointed directly into the face of a young woman for several seconds. She stared back at it with a look too woebegone to forget, then stumbled and fell.

She may have been trampled. I hope so. One of those six horses had looked like that when the stuff was beginning to hit his vitals.

The last sequence showed Berlin and the roads around it a week after the raid. The city was dead, there was not a man, a woman, a child—nor cats, nor dogs, not even a pigeon.

Bodies were all around, but they were safe from rats. There were no rats.

The roads around Berlin were quiet now. Scattered carelessly on shoulders and in ditches, and to a lesser extent on the pavement itself, like coal shaken off a train, were the quiet heaps that had been the citizens of the capital of the Reich. There is no use in talking about it.

But, so far as I am concerned, I left what soul I had in that projection room and I have not had one since.

The two pilots who made the pictures eventually died—systemic, cumulative infection, dust in the air over Berlin. With precautions it need not have happened, but the English did not believe, as yet, that our extreme precautions were necessary.

THE REICH took about a week to fold up. It might have taken longer if the new Fuehrer had not gone to Berlin the day after the raid to "prove" that the British boasts had been hollow. There is no need to recount the provisional governments that Germany had in the following several months; the only one we are concerned with is the so-called restored monarchy which used a cousin of the old Kaiser as a symbol, the one that sued for peace.

Then the trouble started.

When the Prime Minister announced the terms of the private agreement he had had with our President, he was met with a silence that was broken only by cries of "Shame! Shame! Resign!" I suppose it was inevitable; the Commons reflected the spirit of a people who had been unmercifully punished for four years. They were in a mood to enforce a peace that would have

made the Versailles Treaty look like the Beatitudes.

The vote of no confidence left the Prime Minister no choice. Forty-eight hours later the King made a speech from the throne that violated all constitutional precedent, for it had not been written by a Prime Minister. In this greatest crisis in his reign, his voice was clear and unlabored; it sold the idea to England and a national coalition government was formed.

I don't know whether we would have dusted London to enforce our terms or not; Manning thinks we would have done so. I suppose it depended on the character of the President of the United States, and there is no way of knowing about that since we did not have to do it.

THE UNITED STATES, and in particular the President of the United States, was confronted by two inescapable problems. First, we had to consolidate our position at once, use our temporary advantage of an overwhelmingly powerful weapon to insure that such a weapon would not be turned on us. Second, some means had to be worked out to stabilize American foreign policy so that it could handle the tremendous power we had suddenly had thrust upon us.

The second was by far the most difficult and serious. If we were to establish a reasonably permanent peace—say a century or so—through a monopoly on a weapon so powerful that no one dare fight us, it was imperative that the policy under which we acted be more lasting than passing political administrations. But more of that later—

The first problem had to be attended to at once—time was the heart of it. The emergency lay in the very simplicity of the weapon.

It required nothing but aircraft to scatter it and the dust itself, which was easily and quickly made by anyone possessing the secret of the Karst-Obre process and having access to a small supply of uranium-bearing ore.

But the Karst-Obre process was simple and might be independently developed at any time. Manning reported to the President that it was Ridpath's opinion, concurred in by Manning, that the staff of any modern radiation laboratory should be able to work out an equivalent technique in six weeks, working from the hint given by the events in Berlin alone, and should then be able to produce enough dust to cause major destruction in another six weeks.

Ninety days—ninety days *provided* they started from scratch and were not already halfway to their goal. Less than ninety days—perhaps no time at all—

By this time Manning was an unofficial member of the cabinet; "Secretary of Dust," the President called him in one of his rare jovial moods. As for me, well, I attended cabinet meetings, too. As the only layman who had seen the whole show from beginning to end, the President wanted me there.

I am an ordinary sort of man who, by a concatenation of improbabilities, found himself shoved into the councils of the rulers. But I found that the rulers were ordinary men, too, and frequently as bewildered as I was.

But Manning was no ordinary man. In him ordinary hard sense had been raised to the level of genius. Oh, yes, I know that it is popular to blame everything on him and to call him everything from traitor to mad dog, but I still think he was both wise and benevolent. I don't care

how many second-guessing historians disagree with me.

"I PROPOSE," said Manning, "that we begin by immobilizing all aircraft throughout the world."

The secretary of commerce raised his brows. "Aren't you," he said, "being a little fantastic, Colonel Manning?"

"No, I'm not," answered Manning shortly. "I'm being realistic. The key to this problem is aircraft. Without aircraft the dust is an inefficient weapon. The only way I see to gain time enough to deal with the whole problem is to ground all aircraft and put them out of operation. All aircraft, that is, not actually in the service of the United States army. After that we can deal with complete world disarmament and permanent methods of control."

"Really now," replied the secretary, "you are not proposing that commercial airlines be put out of operation. They are an essential part of world economy. It would be an intolerable nuisance."

"Getting killed is an intolerable nuisance, too," Manning answered stubbornly. "I do propose just that. All aircraft. *All*."

The President had been listening without comment to the discussion. He now cut in. "How about aircraft on which some groups depend to stay alive, colonel, such as the Alaskan lines?"

"If there are such, they must be operated by American army pilots and crews. No exceptions."

The secretary of commerce looked startled. "Am I to infer from that last remark that you intended this prohibition to apply to the *United States* as well as other nations?"

"Naturally."

"But that's impossible. It's un-

constitutional. It violates civil rights."

"Killing a man violates his civil rights, too," Manning answered stubbornly.

"You can't do it. Any Federal court in the country would enjoin you in five minutes."

"It seems to me," said Manning slowly, "that Andy Jackson gave us a good precedent for that one when he told John Marshall to go fly a kite." He looked slowly around the table at faces that ranged from undecided to antagonistic. "The issue is sharp, gentlemen, and we might as well drag it out in the open. We can be dead men, with everything in due order, constitutional, and technically correct; or we can do what has to be done, stay alive, and try to straighten out the legal aspects later." He shut up and waited.

The secretary of labor picked it up. "I don't think the colonel has any corner on realism. I think I see the problem, too, and I admit it is a serious one. The dust must never be used again. Had I known about it soon enough, it would never have been used on Berlin. And I agree that some sort of world-wide control is necessary. But where I differ with the colonel is in the method. What he proposes is a military dictatorship imposed by force on the whole world. Admit it, colonel. Isn't that what you are proposing?"

Manning did not dodge it. "That is what I am proposing."

"Thanks. Now we know where we stand. I, for one, do not regard democratic measures and constitutional procedure as of so little importance that I am willing to jettison them any time it becomes convenient. To me, democracy is more than a matter of expediency, it is a faith. Either it works, or I go under with it."

"What do you propose?" asked the President.

"I propose that we treat this as an opportunity to create a world-wide democratic commonwealth! Let us use our present dominant position to issue a call to all nations to send representatives to a conference to form a world constitution."

"League of Nations," I heard some one mutter.

"No!" he answered the side remark. "Not a League of Nations. The old League was helpless because it had no real existence, no power. It was not implemented to enforce its decisions; it was just a debating society, a sham. This would be different for we would turn over the dust to it!"

NOBODY spoke for some minutes. You could see them turning it over in their minds, doubtful, partially approving, intrigued but dubious.

"I'd like to answer that," said Manning.

"Go ahead," said the President.

"I will. I'm going to have to use some pretty plain language and I hope that Secretary Larner will do me the honor of believing that I speak so from sincerity and deep concern and not from personal pique.

"I think a world democracy would be a very fine thing and I ask that you believe me when I say I would willingly lay down my life to accomplish it. I also think it would be a very fine thing for the lion to lie down with the lamb, but I am reasonably certain that only the lion would get up. If we try to form an actual world democracy, we'll be the lamb in the set-up."

"There are a lot of good, kindly people who are internationalists these days. Nine out of ten of them are soft in the head and the tenth is ignorant. If we set up a world-wide

democracy, what will the electorate be? Take a look at the facts: Four hundred million Chinese with no more concept of voting and citizen responsibility than a flea. Three hundred million Hindus who aren't much better indoctrinated. God knows how many in the Eurasian Union who believe in God knows what. The entire continent of Africa only semicivilized. Eighty million Japanese who really believe that they are Heaven-ordained to rule. Our Spanish-American friends who might trail along with us and might not, but who don't understand the Bill of Rights the way we think of it. A quarter of a billion people of two dozen different nationalities in Europe, all with revenge and black hatred in their hearts.

"No, it won't wash. It's preposterous to talk about a world democracy for many years to come. If you turn the secret of the dust over to such a body, you will be arming the whole world to commit suicide."

Larner answered at once. "I could resent some of your remarks, but I won't. To put it bluntly, I consider the source. The trouble with you, Colonel Manning, is that you are a professional soldier and have no faith in people. Soldiers may be necessary, but the worst of them are martinets and the best are merely paternalistic." There was quite a lot more of the same.

Manning stood it until his turn came again. "Maybe I am all those things, but you haven't met my argument. *What are you going to do about the hundreds of millions of people who have no experience in, nor love for, democracy?* Now, perhaps, I don't have the same conception of democracy as yourself, but I do know this: Out west there are a couple of hundred thousand people who sent me to Congress. I am not

going to stand quietly by and let a course be followed which I think will result in their deaths or utter ruin.

"Here is the probable future, as I see it, potential in the smashing of the atom and the development of lethal artificial radioactives. Some power makes a supply of the dust. They'll hit us first to try to knock us out and give them a free hand. New York and Washington overnight, then all of our industrial areas while we are still politically and economically disorganized. But our army would not be in those cities; we would have planes and a supply of dust somewhere where the first dusting wouldn't touch them. Our boys would bravely and righteously proceed to poison their big cities. Back and forth it would go until the organization of each country had broken down so completely that they were no longer able to maintain a sufficiently high level of industrialization to service planes and manufacture dust. That presupposes starvation and plague in the process. You can fill in the details.

"The other nations would get in the game. It would be silly and suicidal, of course, but it doesn't take brains to take a hand in this. All it takes is a very small group, hungry for power, a few airplanes and a supply of dust. *It's a vicious circle that can not possibly be stopped until the entire planet has dropped to a level of economy too low to support the techniques necessary to maintain it.* My best guess is that such a point would be reached when approximately three-quarters of the world's population were dead of dust, disease, or hunger, and culture reduced to the peasant-and-village type.

"Where is your Constitution and your Bill of Rights if you let that happen?"

I'VE SHORTENED it down, but that was the gist of it. I can't hope to record every word of an argument that went on for days.

The secretary of the navy took a crack at him next. "Aren't you getting a bit hysterical, colonel? After all, the world has seen a lot of weapons which were going to make war an impossibility too horrible to contemplate. Poison gas, and tanks, and airplanes—even firearms, if I remember my history."

Manning smiled wryly. "You've made a point, Mr. Secretary. 'And when the wolf *really* came, the little boy shouted in vain.' I imagine the Chamber of Commerce in Pompeii presented the same reasonable argument to any early vulcanologist so timid as to fear Vesuvius. I'll try to justify my fears. The dust differs from every earlier weapon in its deadliness and ease of use, but most importantly in that we have developed no defense against it. For a number of fairly technical reasons, I don't think we ever will, at least not this century."

"Why not?"

"Because there is no way to counteract radioactivity short of putting a lead shield between yourself and it, an *air-tight* lead shield. People might survive by living in sealed underground cities, but our characteristic American culture could not be maintained."

"Colonel Manning," suggested the secretary of state, "I think you have overlooked the obvious alternative."

"Have I?"

"Yes—to keep the dust as our own secret, go our own way, and let the rest of the world look out for itself. That is the only program that fits our traditions." The secretary of state was really a fine old gentleman, and not stupid, but he was slow to assimilate new ideas.

"Mr. Secretary," said Manning respectfully, "I wish we could afford to mind our own business. I do wish we could. But it is the best opinion of all the experts that we can't maintain control of this secret except by rigid policing. The Germans were close on our heels in nuclear research; it was sheer luck that we got there first. I ask you to imagine Germany a year hence—with a supply of dust."

The secretary did not answer, but I saw his lips form the word Berlin.

THEY CAME around. The President had deliberately let Manning bear the brunt of the argument, conserving his own stock of goodwill to coax the obdurate. He decided against putting it up to Congress; the dusts would have been overhead before each senator had finished his say. What he intended to do might be unconstitutional, but if he failed to act there might not be any Constitution shortly. There was precedent—the Emancipation Proclamation, the Monroe Doctrine, the Louisiana Purchase, suspension of habeas corpus in the War between the States, the Destroyer Deal.

On February 22nd the President declared a state of full emergency internally and sent his Peace Proclamation to the head of every sovereign state. Divested of its diplomatic surplusage, it said: The United States is prepared to defeat any power, or combination of powers, in jig time. Accordingly, we are outlawing war and are calling on every nation to disarm completely at once. In other words, "Throw down your guns, boys; we've got the drop on you!"

A supplement set forth the procedure: All aircraft capable of flying the Atlantic were to be delivered in one week's time to a field, or rather a

great stretch of prairie, just west of Fort Riley, Kansas. For lesser aircraft, a spot near Shanghai and a rendezvous in Wales were designated. Memoranda would be issued later with respect to other war equipment. Uranium and its ores were not mentioned; that would come later.

No excuses. Failure to disarm would be construed as an act of war against the United States.

THERE WERE no cases of apoplexy in the Senate; why not, I don't know.

There were only three powers to be seriously worried about, England, Japan, and the Eurasian Union. England had been forewarned, we had pulled her out of a war she was losing, and she—or rather her men in power—knew accurately what we could and would do.

Japan was another matter. They had not seen Berlin and they did not really believe it. Besides, they had been telling each other for so many years that they were unbeatable, they believed it. It does not do to get too tough with a Japanese too quickly, for they will die rather than lose face. The negotiations were conducted very quietly indeed, but our fleet was halfway from Pearl Harbor to Kobe, loaded with enough dust to sterilize their six biggest cities, before they were concluded. Do you know what did it? This never hit the newspapers but it was the wording of the pamphlets we proposed to scatter before dusting.

The Emperor was pleased to declare a New Order of Peace. The official version, built up for home consumption, made the whole matter one of collaboration between two great and friendly powers, with Japan taking the initiative.

The Eurasian Union was a puzzle. After Stalin's unexpected death

in 1941, no western nation knew very much about what went on in there. Our own diplomatic relations had atrophied through failure to replace men called home nearly four years before. Everybody knew, of course, that the new group in power called themselves Fifth Internationalists, but what that meant, aside from ceasing to display the pictures of Lenin and Stalin, nobody knew.

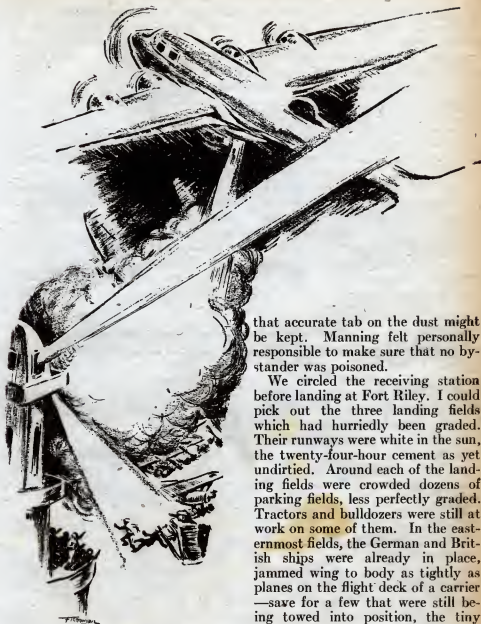
But they agreed to our terms and offered to co-operate in every way. They pointed out that the Union had never been warlike and had kept out of the recent world struggle. It was fitting that the two remaining great powers should use their greatness to insure a lasting peace.

I was delighted; I had been worried about the E. U.

They commenced delivery of some of their smaller planes to the receiving station near Shanghai at once. The reports on the number and quality of the planes seemed to indicate that they had stayed out of the war through necessity; the planes were mostly of German make and in poor condition, types that Germany had abandoned early in the war.

Manning went west to supervise certain details in connection with immobilizing the big planes, the trans-oceanic planes, which were to gather near Fort Riley. We planned to spray them with oil, then dust from a low altitude, as in crop dusting, with a low concentration of one-year dust. Then we could turn our backs on them and forget them, while attending to other matters.

But there were hazards. The dust must not be allowed to reach Kansas City, Lincoln, Wichita, any of the nearby cities. The smaller towns roundabout had been temporarily evacuated. Testing stations needed to be set up in all directions in order



*Some flew too low, and died
by the poison they dropped.*

that accurate tab on the dust might be kept. Manning felt personally responsible to make sure that no bystander was poisoned.

We circled the receiving station before landing at Fort Riley. I could pick out the three landing fields which had hurriedly been graded. Their runways were white in the sun, the twenty-four-hour cement as yet undirtied. Around each of the landing fields were crowded dozens of parking fields, less perfectly graded. Tractors and bulldozers were still at work on some of them. In the easternmost fields, the German and British ships were already in place, jammed wing to body as tightly as planes on the flight deck of a carrier—save for a few that were still being towed into position, the tiny tractors looking from the air like ants dragging pieces of leaf many times larger than themselves.

Only three flying fortresses had arrived from the Eurasian Union. Their representatives had asked for a short delay in order that a supply of high-test aviation gasoline might

be delivered to them. They claimed a shortage of fuel necessary to make the long flight over the Arctic safe. There was no way to check the claim and the delay was granted while a shipment was routed from England.

WE WERE about to leave, Manning having satisfied himself as to safety precautions, when a dispatch came in announcing that a flight of E. U. bombers might be expected before the day was out. Manning wanted to see them arrive; we waited around for four hours. When it was finally reported that our escort of fighters had picked them up at the Canadian border, Manning appeared to have grown fidgety and stated that he would watch them from the air. We took off, gained altitude and waited.

There were nine of them in the flight, cruising in column of echelons and looking so huge that our little fighters were hardly noticeable. They circled the field and I was admiring the stately dignity of them when Manning's pilot, Lieutenant Rafferty, exclaimed, "What the devil! They are preparing to land downwind!"

I still did not tumble, but Manning shouted to the co-pilot, "Get the field!"

He fiddled with his instruments and announced, "Got 'em, sir!"

"General alarm! Armor!"

We could not hear the sirens, naturally, but I could see the white plumes rise from the big steam whistle on the roof of the Administration Building—three long blasts, then three short ones. It seemed almost at the same time that the first cloud broke from the E. U. planes.

Instead of landing, they passed low over the receiving station, jam-packed now with ships from all over the world. Each echelon picked one of three groups centered around the

three landing fields and streamers of heavy brown smoke poured from the bellies of the E. U. ships. I saw a tiny black figure jump from a tractor and run toward the nearest building. Then the smoke screen obscured the field.

"Do you still have the field?" demanded Manning.

"Yes, sir."

"Cross connect to the chief safety technician. Hurry!"

The co-pilot cut in the amplifier so that Manning could talk directly. "Saunders? This is Manning. How about it?"

"Radioactive, chief. Intensity seven point four."

They had paralleled the Karst-Obre research.

MANNING cut him off and demanded that the communication office at the field raise the chief of staff. There was nerve-stretching delay, for it had to be routed over landwire to Kansas City, and some chief operator had to be convinced that she should commandeer a trunk line that was in commercial use. But we got through at last and Manning made his report. "It stands to reason," I heard him say, "that other flights are approaching the border by this time. New York, of course, and Washington. Probably Detroit and Chicago as well. No way of knowing."

The chief of staff cut off abruptly, without comment. I knew that the U. S. air fleets, in a state of alert for weeks past, would have their orders in a few-seconds, and would be on their way to hunt out and down the attackers, if possible before they could reach the cities.

I glanced back at the field. The formations were broken up. One of the E. U. bombers was down, crashed, half a mile beyond the sta-

tion. While I watched, one of our midget dive bombers screamed down on a behemoth E. U. ship and unloaded his eggs. It was a center hit, but the American pilot had cut it too fine, could not pull out, and crashed before his victim.

THERE IS no point in rehashing the newspaper stories of the Four-days War. The point is that we should have lost it, and we would have, had it not been for an unlikely combination of luck, foresight and good management. Apparently, the nuclear physicists of the Eurasian Union were almost as far along as Ridpath's crew when the destruction of Berlin gave them the tip they needed. But we had rushed them, forced them to move before they were ready, because of the deadline for disarmament set forth in our Peace Proclamation.

If the President had waited to fight it out with Congress before issuing the proclamation, there would not be any United States.

Manning never got credit for it, but it is evident to me that he anticipated the possibility of something like the Four-days War and prepared for it in a dozen different devious ways. I don't mean military preparation; the army and the navy saw to that. But it was no accident that Congress was adjourned at the time, I had something to do with the vote-swapping and compromising that led up to it, and I know.

But I put it to you—would he have maneuvered to get Congress out of Washington at a time when he feared that Washington might be attacked if he had had dictatorial ambitions?

Of course, it was the President who was back of the ten-day leaves that had been granted to most of the civil-service personnel in Washing-

ton and he himself must have made the decision to take a swing through the South at that time, but it must have been Manning who put the idea in his head. It is inconceivable that the President would have left Washington to escape personal danger.

And then, there was the plague scare. I don't know how or when Manning could have started that—it certainly did not go through my notebook—but I simply do not believe that it was accidental that a completely unfounded rumor of bubonic plague caused New York City to be semi-deserted at the time the E. U. bombers struck.

At that, we lost over eight hundred thousand people in Manhattan alone.

Of course, the government was blamed for the lives that were lost and the papers were merciless in their criticism at the failure to anticipate and force an evacuation of all the major cities.

If Manning anticipated trouble, why did he not ask for evacuation?

Well, as I see it, for this reason:

A big city will not, never has, evacuated in response to rational argument. London never was evacuated on any major scale and we failed utterly in our attempt to force the evacuation of Berlin. The people of New York City had considered the danger of air raids since 1940 and were long since hardened to the thought.

But the fear of a nonexistent epidemic of plague caused the most nearly complete evacuation of a major city ever seen.

And don't forget what we did to Vladivostok and Irkutsk and Moscow—those were innocent people, too. War isn't pretty.

I said luck played a part. It was bad navigation that caused one of

our ships to dust Ryazan instead of Moscow, but that mistake knocked out the laboratory and plant which produced the only supply of military radioactives in the Eurasian Union. Suppose the mistake had been the other way around—suppose that one of the E. U. ships in attacking Washington, D. C., by mistake, had included Ridpath's shop forty-five miles away in Maryland?

CONGRESS reconvened at the temporary capital in St. Louis, and the American Pacification Expedition started the job of pulling the fangs of the Eurasian Union. It was not a military occupation in the usual sense; there were two simple objectives, to search out and dust all aircraft, aircraft plants, and fields, and to locate and dust radiation laboratories, uranium supplies, and lodes of carnotite and pitchblende. No attempt was made to interfere with, or to replace, civil government.

We used a two-year dust, which gave a breathing spell in which to consolidate our position. Liberal rewards were offered to informers, a technique which worked remarkably well not only in the E. U., but in most parts of the world.

The "weasel," an instrument to smell out radiation, based on the electroscope-discharge principle and refined by Ridpath's staff, greatly facilitated the work of locating uranium and uranium ores. A grid of weasels, properly spaced over a suspect area, could locate any important mass of uranium almost as handily as a direction-finder can spot a radio station.

But, notwithstanding the excellent work of General Bulfinch and the Pacification Expedition as a whole, it was the original mistake of dusting Ryazan that made the job possible of accomplishment.

ANYONE interested in the details of the pacification work done in 1945-6 should see the "Proceedings of the American Foundation for Social Research" for a paper entitled, *A Study of the Execution of the American Peace Policy from February, 1945*. The *de facto* solution of the problem of policing the world against war left the United States with the much greater problem of perfecting a policy that would insure that the deadly power of the dust would never fall into unfit hands.

The problem is as easy to state as the problem of squaring the circle and almost as impossible of accomplishment. Both Manning and the President believed that the United States must of necessity keep the power for the time being until some permanent institution could be developed fit to retain it. The hazard was this: Foreign policy is lodged jointly in the hands of the President and the Congress. We were fortunate at the time in having a good President and an adequate Congress, but that was no guarantee for the future. We have had unfit Presidents and power-hungry Congresses—oh, yes! Read the history of the Mexican War.

We were about to hand over to future governments of the United States the power to turn the entire globe into an empire, our empire. And it was the sober opinion of the President that our characteristic and beloved democratic culture would not stand up under the temptation. Imperialism degrades both oppressor and oppressed.

The President was determined that our sudden power should be used for the absolute minimum of maintaining peace in the world—the simple purpose of outlawing war and nothing else. It must not be used to protect American investments

abroad, to coerce trade agreements, for any purpose but the simple abolition of mass killing.

There is no science of sociology. Perhaps there will be, some day, when a rigorous physics gives a finished science of colloidal chemistry and that leads in turn to a complete knowledge of biology, and from there to a definitive psychology. After that we may begin to know something about sociology and politics. Sometime around the year 5,000 A. D., maybe—if the human race does not commit suicide before then.

Until then, there is only horse sense and rule of thumb and observational knowledge of probabilities. Manning and the President played by ear.

THE TREATIES with Great Britain, Germany and the Eurasian Union, whereby we assumed the responsibility for world peace and at the same time guaranteed the contracting nations against our own misuse of power were rushed through in the period of relief and good will that immediately followed the termination of the Four-days War. We followed the precedents established by the Panama Canal treaties, the Suez Canal agreements, and the Philippine Independence policy.

But the purpose underneath was to commit future governments of the United States to an irrevocable benevolent policy.

The act to implement the treaties by creating the Commission of World Safety followed soon after, and Colonel Manning became Mr. Commissioner Manning. Commissioners had a life tenure and the intention was to create a body with the integrity, permanence and freedom from outside pressure possessed by the supreme court of the United

States. Since the treaties contemplated an eventual joint trust commissioners need not be American citizens—and the oath they took was *to preserve the peace of the world.*

There was trouble getting that clause past the Congress! Every other similar oath had been to the Constitution of the United States.

Nevertheless the Commission was formed, it took charge of world aircraft, assumed jurisdiction over radioactives, natural and artificial, and commenced the long slow task of building up the Peace Patrol.

Manning envisioned a corps of world policemen, an aristocracy which through selection and indoctrination, could be trusted with unlimited power over the life of every man, every woman, every child on the face of the globe. For the power *would* be unlimited; the precautions necessary to insure the unbeatable weapon from getting loose in the world again made it axiomatic that its custodians would wield power that is safe only in the hands of Diety. There would be no one to guard those selfsame guardians. Their own characters and the watch they kept on each other would be all that stood between the race and disaster.

For the first time in history, supreme political power was to be exerted with no possibility of checks and balances from the outside. Manning took up the task of perfecting it with a dragging subconscious conviction that it was too much for human nature.

The rest of the Commission was appointed slowly, the names being sent to the Senate after long joint consideration by the President and Manning. The director of the Red Cross, an obscure little professor of history from Switzerland, Dr. Igor

Rimski who had developed the Karst-Obre technique independently and whom the A. P. F. had discovered in prison after the dusting of Moscow—those three were the only foreigners. The rest of the list is well known.

Ridpath and his staff were of necessity the original technical crew of the Commission; United States army and navy pilots its first patrolmen. Not all of the pilots available were needed; their records were searched, their habits and associates investigated, their mental processes and emotional attitudes examined by the best psychological research methods available—which weren't good enough. Their final acceptance for the Patrol depended on two personal interviews, one with Manning, one with the President.

Manning told me that he depended more on the President's feeling for character than he did on all the association and reaction tests the psychologists could think up. "It's like the nose of a bloodhound," he said. "In his forty years of practical politics he has seen more phonies than you and I will ever see and each one was trying to sell him something. He can tell one in the dark."

The long-distance plan included the schools for the indoctrination of cadet patrolmen, schools that were to be open to youths of any race, color, or nationality, and from which they would go forth to guard the peace of *every country but their own*. To that country a man would never return during his service. They were to be a deliberately expatriated band of Janizaries, with an obligation only to the Commission and to the race, and welded together with a carefully nurtured *esprit de corps*.

It stood a chance of working. Had

Manning been allowed twenty years without interruption, the original plan might have worked.

THE PRESIDENT'S running mate for re-election was the result of a political compromise. The candidate for Vice President was a confirmed isolationist who had opposed the Peace Commission from the first, but it was he or a party split in a year when the opposition was strong. The President sneaked back in but with a greatly weakened Congress; only his power of veto twice prevented the repeal of the Peace Act. The Vice President did nothing to help him, although he did not publicly lead the insurrection. Manning revised his plans to complete the essential program by the end of 1952, there being no way to predict the temper of the next administration.

We were both overworked and I was beginning to realize that my health was gone. The cause was not far to seek; a photographic film strapped next to my skin would cloud in twenty minutes. I was suffering from cumulative minimal radioactive poisoning. No well-defined cancer that could be operated on, but a systemic deterioration of function and tissue. There was no help for it, and there was work to be done. I've always attributed it mainly to the week I spent sitting on those canisters before the raid on Berlin.

FEBRUARY 17, 1951. I missed the televue flash about the plane crash that killed the President because I was lying down in my apartment. Manning, by that time, was requiring me to rest every afternoon after lunch, though I was still on duty. I first heard about it from my secretary when I returned to my office, and at once hurried into Manning's office.

There was a curious unreality to that meeting. It seemed to me that we had slipped back to that day when I returned from England, the day that Estelle Karst died. He looked up. "Hello, John," he said.

I put my hand on his shoulder. "Don't take it so hard, chief," was all I could think of to say.

Forty-eight hours later came the message from the newly sworn-in President for Manning to report to him. I took it in to him, an official dispatch which I decoded. Manning read it, face impassive.

"Are you going, chief?" I asked.

"Eh? Why, certainly."

I went back into my office, and got my topcoat, gloves, and brief case.

Manning looked up when I came back in. "Never mind, John," he said. "You're not going." I guess I must have looked stubborn, for he added, "You're not to go because there is work to do here. Wait a minute."

He went to his safe, twiddled the dials, opened it and removed a sealed envelope which he threw on the desk between us. "Here are your orders. Get busy."

He went out as I was opening them. I read them through and got busy. There was little enough time.

THE NEW President received Manning standing and in the company of several of his bodyguard and intimates. Manning recognized the senator who had led the movement to use the Patrol to recover expropriated holdings in South America and Rhodesia, as well as the chairman of the committee on aviation with whom he had had several unsatisfactory conferences in an attempt to work out a *modus operandi* for reinstituting commercial airlines.

"You're prompt, I see," said the President. "Good."

Manning bowed.

"We might as well come straight to the point," the chief executive went on. "There are going to be some changes of policy in the administration. I want your resignation."

"I am sorry to have to refuse, sir."

"We'll see about that. In the meantime, Colonel Manning, you are relieved from duty."

"Mr. Commissioner Manning, if you please."

The new President shrugged. "One or the other, as you please. You are relieved, either way."

"I am sorry to disagree again. My appointment is for life."

"That's enough," was the answer. "This is the United States of America. There can be no higher authority. You are under arrest."

I can visualize Manning staring steadily at him for a long moment, then answering slowly, "You are physically able to arrest me, I will concede, but I advise you to wait a few minutes." He stepped to the window. "Look up into the sky."

Six bombers of the Peace Commission patrolled over the Capitol. "None of those pilots are American born," Manning added slowly. "If you confine me, none of us here in this room will live out the day."

There were incidents thereafter, such as the unfortunate affair at Fort Benning three days later, and the outbreak in the wing of the Patrol based in Lisbon and its resultant wholesale dismissals, but for practical purposes, that was all there was to the *coup d'état*.

Manning was the undisputed military dictator of the world.

Whether or not any man as universally hated as Manning can perfect the Patrol he envisioned, make it self-perpetuating and trustworthy,

I don't know, and—because of that week of waiting in a buried English hangar—I won't be here to find out. Manning's heart disease makes the outcome even more uncertain—he may last another twenty years; he may keel over dead tomorrow—and there is no one to take his place. I've set this down partly to occupy the short time I have left and partly to show there is another side to any story, even world dominion.

Not that I would like the outcome, either way. If there is anything to this survival-after-death business, I am going to look up the man who invented the bow and arrow and take him apart with my bare hands. For myself, I can't be happy in a world where any man, or group of men, has the power of death over you and me, our neighbors, every human, every animal, every living thing. I don't like anyone to have that kind of power.

And neither does Manning.

Editor's Note:

This story presents a logical possibility of the near future; atomic power plants, in burning atomic fuel, will automatically and inevitably produce artificial radioactive ashes. But, even more, this story presents the problem mankind must solve some day, soon or late. The problem can be generalized to cover any irresistible weapon; *how can it be controlled.*

The solution offered herein is—unsatisfactory. "DeFries" points that out. Dr. E. E. Smith recognized a similar problem in the formation of any all-powerful law-enforcing body such as his Galactic Patrol.

Who will watch the watchmen? Smith's solution was complete and workable—the Arisian supermen.

MacDonald's purely human solution offers this trouble beyond the one suggested within the body of the story. Manning, the first commissioner, was trained in a democratic culture, by the officers of a democracy's army. His later successors would, presumably, be drawn from the ranks of the Patrol by promotion, that being the only body of men consciously and rigorously schooled through a lifetime to the ideal of the world view. They would be men trained away from and above petty nationalism.

They would be men trained by a military absolutism to standards of more-than-normal perfection. Necessarily and characteristically, such a military absolutism recognizes no difference between human failings and intentional treason.

The solution is unsatisfactory from start to finish. But—is there any better one? Can you suggest one? Remember that the conditions are; the irresistible weapon has been discovered. It can be duplicated easily by small groups, so that only the most rigorous and minute policing—intruding on every individual's private life—can prevent it escaping control to be turned on all men. That it is capable of upsetting any organized tyranny and—most important of all—*every manner and form of government is considered tyranny by someone.* Even anarchy, no government at all, is "tyranny" to the most dangerous of all types—the power-mad, for it "tyrannically" refuses them power. The world must be defended against every little knot of crackpots with a mission—and the horrible weapon.

Can any solution not invoking the aid of the Arisian super-beings protect mankind against the irresistible weapon, in the form MacDonald has suggested or any other?

THE END.



IN TIMES TO COME

COMING next issue is a Ross Rocklynne problem yarn. It's a nice proposition he has here—a detective story in reverse, you might say. Detective stories in science-fiction are decidedly unsatisfying; they're supposed to be a challenge for the reader to solve the case before the explanation is given. In science-fiction, they're fundamentally unfair. The locked-room mystery, for instance, might be solved by (a) the villain's possession of an invisibility suit, (b) a fourth-dimensional penetration, (c) time-traveling, or, (d) radio transportation of the murderer into and out of the locked room. Nice, neat, but not fair to the reader; the author can pull anything he wants out of the hat.

Rocklynne's yarn is slightly different. "Time Wants a Skeleton" involves time traveling, but the mystery is not of the "whodunit" variety—it's a question of who was it done to. There's a skeleton on an asteroid, and an unique sort of ring on the skeleton's finger before the party of five men and a girl are thrown back in time some millions of years. One of them has—and most heartily does not want!—that ring. But, they know, Time can't be cheated. There's going to be a skeleton, and it will wear that ring. Somebody is elected to die—but they can't know who!

"Time Wants a Skeleton"—and there's a great deal of co-operation in the crew. Everybody seems willing to supply Time with the skeleton—somebody else's skeleton! A lovely, murder-minded time is had by all—not that they're basically murderous; it's just a matter of self-defense. The ring—which can't be disposed of, no matter how thoroughly they try—adds to the gaiety of the six people trapped in time. THE EDITOR.

ANALYTICAL LABORATORY

One characteristic of the present method of determining the point scores—rating first-place votes 1, second-place votes 2, et cetera, adding total vote-points a story gets, and dividing by number of votes—is that diversity of opinion means high-point scores. In this issue, for instance, "Sixth Column" was fairly unanimously voted first or at least second place, fighting it out mainly with "Logic of Empire." Hence, these two got most of the 1's and 2's. But when it came to the rest, agreement was very poor. Apparently the general feeling was that they were all good yarns. That meant that whether the story got a 3, or a 7, was a hard, close decision.

The result, as seen, was that every story got a few 7's, and some 3's and 4's. The point-score seems to indicate a wide gap of choice between the first two, and the rest; actually, apparently, the first two had just enough lead to make readers pick them fairly consistently, but vary widely on the others. The scores stood:

<i>Story</i>	<i>Author</i>	<i>Points</i>
1. Sixth Column	Anson MacDonald	1.56
2. Logic of Empire	Robert Heinlein	2.37
3. Poker Face	Theodore Sturgeon	4.10
4. Eccentric Orbit	D. B. Thompson	4.40
5. Masquerade	Clifford D. Simak	4.90

THE EDITOR.

JAY SCORE

By Eric Frank Russell

He had no friends, only respect, but the terrible test of the Sun proved him a friend to have!

Illustrated by Schneeman

THERE are very good reasons for everything they do. To the uninitiated some of their little tricks and some of their regulations seem mighty peculiar—but rocketing through the cosmos isn't quite like paddling a bathtub across a farm pond, no sir!

This stunt of using mixed crews, for instance, is pretty sensible when you look into it. On the outward runs toward Mars, the asteroids and beyond, they have white Terrestrials to run the engines and do the navigating because they're the ones who perfected rocketships, know most about them, and can handle them like nobody else. All ship's surgeons are black Terrestrials because, for some reason nobody's ever been able to explain, no Negro gets gravity bends or space nausea. Every outside repair gang is composed of Martians because they use very little air, are tiptop metal workers, and fairly immune from cosmic-ray burn.

As for the inward trips to Venus, they mix them pretty much the same—except that the emergency pilot is always a big clunker like Jay Score. There's a reason for that—he was the reason! I'm not likely to forget him—he sort of sticks in the mind. What a guy!

Fortune put me at the top of the gangway the first time he appeared. Our ship was the *Upskadaska City*, a brand-new freighter with limited

passenger accommodation, registered in the Venusian port from which she took her name. Needless to say, she was known among spacefarers as the *Upsydaisy*.

We were in the Colorado Rocket Basin, just north of Denver, with a fair load aboard, mostly watchmaking machinery, scientific instruments, agricultural equipment, aeronautical jigs and tools for Upskadaska, as well as a case of radium needles for the Venusian Cancer Research Institute. There were eight passengers, all agriculturists. We'd kangarooed the vessel and were waiting for the blow-brothers-blow siren due in forty minutes, when Jay Score arrived.

He was six feet nine, about three hundred pounds, and he toted his bulk with the easy grace of a ballet dancer. A big guy like that, moving like that, was something worth watching. He came up the duralumin gangway with the nonchalance of a tripper boarding the bus for Jackson's Creek, and he was dangling from his hamlike right fist a rawhide case not quite big enough to hold his bed and maybe a wardrobe or two.

At the top he took in the crossed swords on my cap, said, "Morning, sarge. I'm the new E. P. I've got to report to Captain McNulty."

I knew a fresh emergency pilot was due. Jeff Durkin had been pro-



Chess won him the respect of the Martians. Before him, no one from Earth had beaten a Martian at Earth's own game.

moted to the snooty Martian scent-box *Prometheus*. So this was his successor! He was a Terrestrial, all right, but neither white nor black. His expressionless but capable face looked as if covered with old, well-seasoned leather. His eyes held fires, almost like phosphorescence. There was an air about him that marked

him out as an exceptional individual.

"Welcome, Tiny," I said. I didn't offer my hand, because I wanted it for use later on. "Open your satchel and leave it in the sterilizing chamber. You'll find the skipper in the bow."

"Thanks!" he responded, without the glimmer of a smile. He stepped

into the air lock, swinging the rawhide bungalow at his side.

"We blast in forty minutes," I warned him.

DIDN'T SEE anything more of Jay Score until we were two hundred thousand out, with Earth a greenish moon at the end of our vapor-wake. Then I heard him in the passage asking where he could find the sergeant at arms. He was directed through my door.

"Sarge," he said, handing over his official requisition, "I've come to collect the trimmings." Then he leaned on the barrier, the whole framework creaked, the top tube sagged in the middle.

"Hey!" I shouted.

"Sorry!" He unleaned. The barrier stood much better while he had his weight on his dogs.

I stamped his requisition, went into the armory, got him his needle ray pistol and an issue of capsules for same. The biggest Venusian mud skis I could find were about seven sizes too small and a yard too short for him, but they had to do. He got a can of thin, multipurpose oil, a jar of graphite, a Lepanto power-pack for his microwave radiophone and, finally, a bunch of nutweed pellicules marked: "Compliments of the Bridal Planet Aromatic Herbal Corporation."

Shoving back the spicy junk lumps, he said, "You have 'em—they give me the staggers." The rest of the stuff he gathered without so much as twitching an eyebrow. I've never seen anyone so poker-faced.

All the same, the way he eyed the spacesuits seemed somewhat wistful. There were thirty bifurcated ones for the Terrestrials, all hanging on the wall like sloughed skins. There were also six head-and-shoulder helmets for the Martians,

since they needed no more than three pounds of air. There wasn't a suit for him. I couldn't have fitted him with one if my life had depended on it—it'd have been like trying to can an elephant.

Well, he lumbered out lightly, if you get what I mean. The casual way he transported his tonnage made me think that I'd sure like to be some place else if ever he got on a rampage. Not that I thought him likely to run amuck—he was amiable enough, though sphinxlike. But I was fascinated by his air of calm certainty, and by his motion which was fast and eerie and silent. The latter, I guess, was because he favored an inch of sponge rubber under his dogs.

I kept my eyes on Jay Score while the *Upsydaisy* made good time on her crawl through the void. Yes, I was curious about him because his type was a new one on me—and I've seen plenty in my time. He remained uncommunicative but always polite, while his work was smooth, efficient and in every way satisfactory. McNulty took a great fancy to him—and he never had been one to greet a newcomer with love and kisses.

THREE DAYS out, Jay made a great hit with the Martians. As everyone knows, those goggle-eyed, ten-tentacled, half-breathing kibitzers have stuck harder than glue to the Solar System Chess Championship for more than two centuries. Nobody outside of Mars will ever pry them loose. They're nuts about it, and many's the time I've seen a bunch of them go through all the colors of the spectrum in sheer excitement when somebody had shifted a pawn after thirty minutes of profound consideration.

One rest time, Jay spent his whole

eight hours under three-pounds pressure in the starboard air lock. Over the lock phones came long silences punctuated by wild and shrill twitterings as if he and the octopuses were turning the place into a madhouse. At the end of the time we found our outside gang exhausted. Seems Jay had consented to play Kli Yang and had forced him to a stalemate. Kli had been sixth runner-up in the last Solar melee, had been beaten only ten times—each time by a brother Martian, of course.

The red-planet gang had the finger on him after that. Every rest time they waylaid him and dragged him into the air lock. When we were eleven days out, he played the six of them simultaneously, lost two games, stalemated three, won one. They thought he was a whiz—for a Terrestrial. Knowing them, I thought so, too. So did McNulty. He stuck the sporting data in the log.

YOU'LL REMEMBER the stunt that the audiopress of 2270 boosted as "McNulty's Miracle Move"? Sure, it's practically a legend of the spaceways. Afterward, when we'd got safely back, McNulty disclaimed all the credit and put it where it rightfully belonged. The audiopress had a good excuse, as usual. They said he was the captain, wasn't he? And his name made the phrase alliterative, didn't it? Seems like there must be a sect of audio journalists who've got to be alliterative to gain salvation.

What precipitated that crazy stunt and whitened my hair was a chunk of flotsam. Said junk was a gob of meteoric nickel iron which was ambling along at the usual cosmic speed of *pssst!* Its orbit was on the planetary plane, and it approached at right angles to our sunward course.

It gave us the business. I'd never have believed anything so small could have made such a slam. To the present day I can hear the whistle of air as it made a break for freedom through that jagged hole.

We lost a lot of political juice before the autodoors sealed the section. Pressure had dropped to nine pounds when the compensators held it and slowly began to build it up again. The drop didn't worry the Martians—nine pounds was still like inhaling pigwash to them.

There was one engineer in that sealed section. A second beat the doors by the toe of his left boot and got clear. But the first, we thought, had drawn his number and eventually would be floated out like so many spacemen who've come to the end of their duty.

The guy who got clear was leaning against a bulwark, skin-white with the narrowness of his squeak, when Jay came pounding in. His jaw was working, and his eyes were like lamps, but his voice was cool and easy.

He said, "Get out and seal this room. I'll make a snatch. Open up and let me through fast when I knock."

With that, he shoved out the other. We sealed the room by closing another autodoor. We couldn't see what the big hunk was doing, but the telltale showed he'd released and opened the door to the damaged section. Ten seconds later, the light went out, showing the door was closed again. Came a hard, urgent knock. We opened. Jay plunged through like a bat out of hell, the engineer's limp body cuddled in his thick arms. He bore it like it was no more than a kitten, and the way he took it down the passage threatened to carry him clear through the nose of the ship.

MEANWHILE, we found we were in a No. 1 mess. The rockets weren't functioning any more. The Venturi tubes were O. K., and the combustion chambers undamaged. The injectors worked without a hitch—providing you pumped them by hand. We'd lost none of our precious fuel, and the shell was intact save for that one jagged hole. What made us useless was the wrecking of our co-ordinated feeding and firing controls. They'd been located in that damaged section and now they were as much scrap.

This was more than serious. General opinion called it certain death. I'm pretty certain that McNulty shared the morbid notion even if his official report did describe it as "an embarrassing predicament." But that's just like McNulty—it's a wonder he didn't define our feelings by recording that we were nonplussed.

Anyway, the Martian squad poured out, some honest work being required of them for the first time in six trips. Pressure had crawled back to fourteen, and they had to come into it to put on their head-and-shoulder contraptions.

Kli Yank sniffed, waved a disgusted tentacle, and chirruped, "I could swim." He eased up when we got his dingbat fixed and exhausted it to his customary three pounds. That's the Martian idea of sarcasm—whenever it's thicker than they like they make sinuous backstrokes and say, "I could swim."

To give them their due, they were good. They can cling to polished ice and work for twelve hours on a ration of oxygen that wouldn't satisfy a Terrestrial for more than ninety minutes. I saw them beat it through the air lock, their goggle eyes peering through their inverted goldfish bowls, their tentacles clutching power lines, sealing plates, and quasi-

arc welders. Blue lights made little auroras outside the ports as they began to cut, shape and seal that ragged hole.

All the time, we continued to bullet onward toward the Sun. But for this cursed misfortune we'd have swung a curve into the orbit of Venus in four hours' time. Then we'd have let her catch us up, and we'd have carefully decelerated to a safe landing. But when that peewee planetoid picked on us we were still headed straight for the biggest and brightest furnace hereabouts. That was the way we were still going, our original velocity being steadily increased by the pull of our fiery destination. I wanted to be cremated—but not yet!

Up in the bow navigation, Jay Score was in constant conference with Captain McNulty and the two astro-computator operators. Outside, the Martians continued to crawl around, fizzing and spitting with flashes of ghastly blue light. The engineers, of course, weren't waiting for them to finish their job—four in spacesuits entered the damaged section and started the task of creating order out of chaos.

I envied all those busy guys and so did many of the others. There's a lot of consolation in being able to do something even in a hopeless situation. There's a lot of misery in being compelled to play with one's fingers while others are active.

Two Martians came in through the lock, grabbed some more plates and crawled out again. One picked up a pocket chess set, but I took it off him. Then I went along to see Sam Hignett, our Negro surgeon.

Sam had dragged back the engineer from the very rim of the grave. He'd done it with oxygen and heart massage. Only his long,

dexterous fingers could have done it. It was a feat that had been brought off before—but not often.

It seemed that Sam didn't know just what had happened and didn't care. He was like that when he had a patient on his hands. Deftly, he closed the chest incision with silver clips, painted the pinched flesh with iodized plastic, cooled the stuff to hardness with a spray of ether.

"Sam," I told him, "you're a marvel!"

"Jay gave me a chance," he said. "He got him here in time."

"Why put the blame on him?" I joked.

"Sergeant," he answered, quite seriously, "I'm the ship's dotcor. I do the best I can. I couldn't have saved this man if Jay hadn't got him to me in time."

"All right, all right," I agreed. "Have it your own way." A good fellow, Sam. But he was like all doctors—you know, ethical. I left him with his breathing patient.

McNULTY came toddling along the catwalk as I went back. He checked up on the fuel tanks. He did it personally, and that meant something. He looked worried, and that meant a devil of a lot—it meant that I needn't bother writing my last will and testament, because it'd never be read.

I watched his portly form dive back into bow navigation, and heard him say, "Jay, I guess you—" before the closing door cut off his voice.

Seemed to have a lot of faith in Jay Score. Well, Jay looked capable enough. The skipper and the laconic E. P. were still acting like cronies even while heading for the final frizzle.

One of the emigrating agriculturists came out of his cabin and caught me before I regained the ar-

mory. Looking at me wide-eyed, he said, "Sergeant, there's a half moon showing through my port."

He continued to pop them at me while I popped mine at him. Venus showing half her pan meant that we were crossing her orbit. He knew it, too—I could tell by the way he bugged them.

"Well," he persisted, "how long is this mishap likely to delay us?"

"No knowing," I replied, quite truthfully. I scratched my head, trying to look confident and stupid at one and the same time. "Captain McNulty will do the best he can. Put your trust in him—Poppa knows best!"

"You don't think that we are . . . er . . . in any danger?"

"Oh, not at all!"

"You're a liar," he said.

"I know it," said I.

That unhorsed him. He went into his cabin, dissatisfied, apprehensive. Pretty soon he'd see Venus in a three-quarter phase and he'd tell the others. Then the fat would be in the fire—our fat in the solar fire.

THE LAST VESTIGES of hope had had drained away just about the time when a terrific roar and a violent tremble told that the long-dead rockets were back into action. The noise didn't last more than a few seconds; they shut them off quickly, the brief burst serving to show that repairs were effective and satisfactory.

The noise brought out the agriculturist at full gallop. He knew the worst by now, and so did the others. It had been impossible to conceal the truth for the three days since he'd seen Venus as a half moon. She was far behind now, and we were cutting the orbit of Mercury. But still the passengers clung desperately

to the chance of somebody performing a miracle.

Charging into the armory, he said, "The rockets are working again! Does that mean—"

"Nothing," I told him, seeing no use in building false hopes.

"But can't we turn around and go back?" He mopped the perspiration trickling down his jowls. It wasn't so much that he was scared as the unpleasant fact that interior conditions were now anything but arctic.

"Sir," I said, "we're moving so all-fired fast that there's nothing to do but hold a lily."

"My ranch," he growled, bitterly. "I was allotted five thousand acres of the best Venusian tobacco-growing country, not to mention a range of uplands for beef."

"Sorry, brother, but the days of the West are through."

Crrrump! went the rockets again. The burst bent me backward and made him bow forward like he had a bad bellyache. Somebody up in bow navigation—McNulty or Jay Score—was blowing them when he felt the whim. I couldn't see any sense in it.

"What's that for?" demanded the complainant, regaining the perpendicular.

"Boys will be boys," I said.

Snorting his disgust, he went back to his cabin. A typical Terrestrial emigrant, big and healthy and tough, he was more peeved than worried.

Half an hour later the general call sounded on the buzzers all over the ship. It was a ground signal, never used in space, and it meant that the entire crew and all other occupants of the vessel were summoned to the central cabin. Imagine guys being called from their posts in full flight! Something unique in the history of space navigation must have been be-

hind that call, probably a compose-yourselves-for-the-end speech by McNulty.

EXPECTING the skipper to preside over the last rites, I wasn't surprised to find him standing on the tiny dais as we assembled. A faint scowl lay over the plump features, but it faded into a ghost of a smile when the Martians mooched in and one of them did some imitation shark-dodging.

Erect beside McNulty¹, expressionless as usual, Jay Score looked at that Martian as if he were a pane of glass. Then his strangely lit orbs roamed idly away as if they'd seen nothing more boring. The swim-joke was getting stale, anyway.

"Men and vedras," began McNulty—the latter being Martian for "adults," and more Martian sarcasm, too—"I've no need to enlarge upon the awkwardness of our position." That man sure could pick his words—awkward! "Already we are nearer the Sun than any space vessel has ever been in the whole history of cosmic navigation."

"Comic navigation," murmured Kli Yang, with tactless wit.

"We'll need your humor to entertain us later," observed Jay Score in a voice so flat that Kli Yang subsided.

"We're moving toward the luminary," went on McNulty, his scowl reappearing, "faster than any space vessel ever moved before. Bluntly, there's not more than one chance in ten thousand of us getting out of this alive." He favored Kli Yang with a challenging glare, but that tentacled individual was now subdued. "However, there is that one chance—and we're going to take it!"

We gaped at him, wondering what the devil he meant. Every one of

us knew that it was absolutely impossible to make a U-bend without touching the Sun, neither would we be able to fight our way back in the reverse direction with all that mighty drag upon us. There was nothing to do but go onward, onward—until the last searing blast scattered our disrupted molecules all over the block.

"What we propose to do is to try a cometary," continued McNulty. "Jay and myself, and the astro-computator operators reckon it's barely possible that we can do it and pull through."

That was plain enough. The stunt was a theoretical one frequently debated by mathematicians and astronavigators, and often used by writers in stories. But this time it was to be the real thing. The idea is to build up all the velocity that can be got, and at the same time to angle into the path of an elongated elliptical orbit like that of a comet. In theory, the vessel then *might* skim the Sun so fast that it would swing like a pendulum far out to the opposite side of the orbit whence it had come. A sweet little trick—but could we make it?

"Calculations show our present condition fair enough to permit a small chance of success," said McNulty. "We've power enough and fuel enough to build up the necessary velocity, to strike the requisite angle, and to maintain both for the proper time. The only point about which I have grave doubt is that of whether we can survive at our nearest to the Sun." He wiped perspiration as if unconsciously to emphasize the shape of things to come. "I won't mince words, men—it's going to be a sample of hell!"

"We're ready, skipper," said somebody, and a low murmur of support ran around the cabin.

KLI YANG got up, simultaneously wagged four arms for attention, and twittered, "It is an idea. It is excellent. I, Kli Yang, endorse it on behalf of my fellow vedras. We shall all cram into the refrigerator and breathe the Terrestrial stink while the Sun goes past?"

McNulty let pass the crack about human odor, nodded, and said, "Everyone will be packed into the cold room and endure it as best they can."

"Exactly," said Kli. "Quite," he added with bland disregard of superfluity. Wiggling a tentacletip at McNulty, he carried on, "But we can't control the ship while we're squatting in the icebox like three and a half dozen strawberry sundaes. There'll have to be control from bow navigation. One individual could hold her on her course—until he gets fried. So somebody's got to be the fryee."

He gave the tip another sinuous wiggle, being under the delusion that it was fascinating his listeners into complete attention. "And since it cannot be denied that we Martians are far less susceptible to extremes of heat, I suggest that—"

"Nuts!" said McNulty. His gruffness deceived nobody. The Martians were nuisances—but grand guys.

"All right." Kli's chirrup rose to a shrill, protesting yelp. "Who else is going to be a crisp?"

"Me, maybe—or not," said Jay Score. It was queer the way he said it—just as if he were a candidate so obvious that only the stone-blind couldn't see him.

He was right, at that! Jay was the very one for the job. If anyone could take what was going to come through the fore observation ports, it was Jay Score. He was big and tough, built for just such a task as this. He had a lot of stuff that none

of us had got and, after all, was a fully qualified E. P.

But it was funny the way I felt about him. I could imagine him up in front, all alone, nobody there, but our lives depending on how much he could take—while the flaming Sun extended its searing fingers—

"You!" ejaculated Kli, breaking my thought. His goggle eyes bulged angrily at the big, laconic figure on the dais. "You would! I'm ready to mate in four moves, and you get yourself locked away."

"Six," contradicted Jay, disinterestedly. "You can't do it in less than six."

"Four," Kli fairly howled. "And right at this point you—"

It was too much for McNulty. He looked as if on the verge of a stroke. His purple face turned on the semaphoring Kli.

"To hell with your blasted chess!" he roared. "Return to your stations, all of you. Make ready for the boost. I'll sound the general call immediately it is necessary to take cover, and then you're all to go to the cold room." He looked around, the purple gradually fading as his blood pressure went down. "That is, all except Jay."

SEEMED LIKE old times with the rockets going full belt. They roared away steadily, like we were running with a tail of thunder. Inside the vessel, the atmosphere got hotter and hotter until moisture glistened on the metal walls and plenty more of the same trickled steadily down our backs. What it was like up in bow navigation I didn't know and didn't care to discover. The Martians weren't inconvenienced yet—which is one time their wacky composition was to be envied.

I didn't keep check of the time, but I'd had two spells of duty with

an intervening sleep period and rest time before the buzzers sounded the general call. By then, things were pretty bad. I was no longer perspiring—I was slowly melting into my boots.

Sam, of course, endured it most easily of all the Terrestrials, and had persisted enough to drag his patient completely out of danger. That engineer was one lucky guy! We'd put him in the cool room right away, with Sam in frequent attendance.

The rest of us dribbled in when the buzzer went. Our sanctuary was more than a mere refrigerator; it was the strongest and coolest section of the vessel, an armored, triply shielded compartment holding the instrument lockers, two sick bays and a large lounge for the benefit of nauseated passengers. It held us all comfortably.

All but the Martians. It held them, but not comfortably. They're never comfortable at fourteen pounds, which they regard as not only thick but also smelly—something like breathing treacle impregnated with old goat.

Under our very eyes, Kli Yang produced a bottle of hooloo scent, handed it to his half parent Kli Morg. The latter took it, stared distastefully at us, then sniffed at it in an ostentatious manner that was positively insulting. But nobody said anything.

All were present excepting McNulty and Jay Score. The Skipper appeared two hours later. It must have been raw up in front, because he looked terrible. His haggard face was beaded and glossy, his formerly plump cheeks sunken and blistered. His usually spruce, well-fitting uniform hung upon him sloppily. It only needed one glance to tell that he'd had a darned good roasting—as much as he could stand.

Walking unsteadily, he crossed the floor, went into the first-aid cubby, stripped himself with slow, painful movements. Sam rubbed him all over with tannic jelly—we could hear the tormented skipper grunting hoarsely as Sam put plenty of pep into his job.

The heat was now on us with a vengeance. It pervaded the walls, the floor, the air, and it created a multitude of stinging sensations in every muscle of my body. Several of the engineers took off their boots and jerkins. After a while, the passengers followed suit, discarding much of their outer clothing. My agriculturist sat a miserable figure in tropical silks, moody over what might have been.

Coming out of the cubby, McNulty flopped onto a bunk, and said, "If we're all O. K. in four hours' time, we're out of the wood!"

At that moment, the rockets faltered. We knew at once what was wrong. A fuel tank had emptied, and the relay had failed to cut in. An engineer should have been ready to switch the conduits. In the heat and excitement, someone had blundered.

THE fact had barely time to sink in before Kli Yang was out through the door. He'd been sitting nearest to it, and was gone before anyone realized the fact. Twenty seconds later the rockets renewed their steady thrum.

A speaking tube whistle shrilled right by my ear. Solar radiation had made the radiophones useless these last two days. Pulling out the whistle, I croaked a throaty, "Well?" into the tube, and heard Jay's voice coming back from bow.

"Who did it?"

"Kli Yang," I told him. "He's still outside."

"Probably gone for the domes," guessed Jay. "Tell him I said thanks!"

"What's it like around where you live?" I asked.

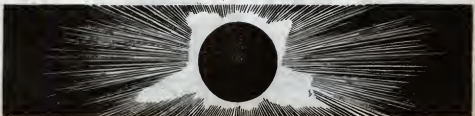
"Fierce," he replied. "It isn't so good . . . for vision." Silence for a moment, then, "Guess I can . . . stick it . . . somehow. Strap in ready for next time I blow the . . . whistle."

"Why?" I half yelled, half rasped. "Going to rotate her—distribute the heat."

A faint squeak told that he'd plugged his end of the tube. Shoving the whistle back, I told the others to strap down in readiness for Jay's signal. The Martians didn't have to bother since they'd got enough first-class suckers to weld them to a sun-fishing meteor.

Kli came back and showed Jay's guess to be correct. He was dragging the squad's head-and-shoulder pieces. The load was about as much as he could pull now that the temperature was up to the point where even he was beginning to wilt.

The Martian moochers donned



their gadgets gladly, carefully sealing the seams, then evacuating them down to three pounds. It made them a lot happier. Remembering that we Terrestrials use spacesuits to keep air in, it seemed queer seeing those guys wearing theirs to keep air out.

They'd just finished and had laid out a chessboard when the whistle squeaked. We braced ourselves; the Martians clamped down their suckers. Slowly and steadily the *Upsy-daisy* began to turn upon her longitudinal axis. The chessboard and pieces tried to stay put, failed, crawled along the floor, up the wall and across the ceiling. Solar pull was making them stick to the sunward side, of course. I saw Kli Morg's strained, heat-ridden face glooming at a black bishop while it skittered around—and I guess that inside his goldfish bowl were resounding some potent samples of Martian invective.

"Three hours and a half," gasped McNulty.

THAT four-hour estimate could only mean two hours of approach to the deadline, and two hours of retreat from it. So the moment when we had two hours to go would be the moment when we were at our nearest to the solar furnace, the moment of our greatest peril.

I wasn't aware of that potent instant; since I passed out twenty minutes before it arrived, and recovered consciousness an hour and a half after it. My dazed mind took what seemed an endless time to realize that we'd now only half an hour to go, thirty minutes to safety!

What had happened in the interval could only be left to my imagination—and I didn't care to think much about that, time. The Sun

blazing with ferocity infinitely greater than a tiger's eye—and a thousand times hungrier. The corona licking out toward this tiny shipload of footlings, half-dead entities. And up in front of the vessel, behind its totally inadequate quartz windows, Jay sitting alone and facing the mounting inferno, staring, staring, staring—

Getting to my feet, I teetered uncertainly, fell over like a bundle of rags. The ship wasn't rotating any longer and we seemed to be bulleting along in perfectly normal fashion. What brought me down was sheer weakness. I felt lousy.

The Martians had already recovered. I knew they'd be the first. One of them lugged me up and held me steady while I got back a percentage of my former control. I noticed that another had sprawled himself right across the unconscious McNulty and three of the passengers. Yes, he'd shielded them from some of the heat. His action was successful, too—for they were the next to come to life.

Struggling to the tube, I extracted the whistle, blew down the funnel. It was a weak, ineffectual blow that brought me no response. Just a waste of good breath on which I was darned short. I hung there dazedly for a full three minutes, then summoned my returning strength, extended my aching chest, blew as hard as I could and heard the shrill cheep of the whistle at the other end. But Jay didn't answer.

Several more attempts didn't bring me the slightest response. The effort cost me a dizzy spell, and down I flopped again. The heat was still terrific; I felt as dehydrated as a mummy dug out of sand a million years old.

Kli Yang opened the door, crept

out with dragging, pain-stricken motion. He was still wearing his head-and-shoulder piece. Five minutes later, he came back, spoke through his helmet's diaphragm:

"Couldn't get near bow navigation. At the midway catwalk it's hotter than an oven, and all the atmosphere's sealed off." He answered the question in my eyes. "Yes, the autodoors are closed—there can't be any air in bow navigation."

NO AIR meant the navigation windows had gone *phut*. Nothing else could have emptied the cabin. Well, we'd sparés for that job, and could make good the damage once we were in the clear. Meanwhile, here we were roaring along, maybe on our correct course and maybe not, with an empty, airless navigation room, and with a speaking tube that gave us nothing but ghastly silence.

Sitting around, we picked up strength. The last one to come out of his coma was the sick engineer. Sam brought him round all right. It was just then that McNulty got excited.

"Four hours!" he shouted. "We've done it!"

We raised a hollow cheer. By Jupiter, the superheated atmosphere seemed to grow ten degrees cooler

with the news! Funny how relief can breed strength—in one minute we conquered all weakness and were rarin' to go. But it was another four hours before a quartet of engineer in spacesuits bore their burden from the airless navigation room.

They carried him into Sam's little place—a long, heavy, silent figure.

I said, "Jay, Jay, how're you making out?"

He must have heard me, for he moved the fingers of his right hand, and emitted a chesty grinding noise before they carried him inside. Two of the engineers went to his cabin, brought back his huge rawhide case. They shut the door, staying in with Sam, leaving me and the Martians hanging around outside. Kli Yang wandered up and down the passage as if he didn't know what to do with his tentacles.

Sam came out after an hour, and we jumped him on the spot.

"How's Jay?"

"Blind as a statue," he said, shaking his head. "And his voice isn't there any more. He's taken an awful beating."

"So that's why he didn't answer on the tube," I looked him straight in the eyes. "Can you . . . can you do anything for him, Sam?"

"I only wish I could!" His black



TOPS 'EM ALL!



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face showed his feelings. "You know how much I'd like to put him right, sergeant—but I can't." He made a gesture of futility. "He's completely beyond my modest skill. Maybe when we get back to Earth—" His voice petered out, and he went back inside.

Kli Yang said, miserably, "I am saddened."

A SCENE I'll never forget as long as I live was that evenning we spent as guests of the Astro Club in New York. That club was then—as it is still—the most exclusive group of human beings ever gathered together. To qualify for membership, you had to perform a feat of astro-navigation tantamount to a miracle. There were only nine members in those days, and there are only twelve now.

Mace Waldron, the famous pilot who saved that Martian liner in 2263, was the chairman. Classy in his soup-and-fish, he stood at the top of the table with Jay Score sitting at his side. At the other end of the table sat McNulty, a broad smirk of satisfaction on his jovial pan. Beside the skipper was old, white-haired Knud Johannsen, the genius who designed the J-series, and a figure known to every spaceman.

Along the sides, and somewhat self-conscious, sat the entire crew of the *Upsydaisy*, including the Martians, plus three of our passengers who'd postponed their trips for this occasion. There were also a couple

of audio journalists with their scanners and mikes.

"Gentlemen and vedras," said Mace, "this is an event without precedent in the history of humanity or this club. Perhaps because of that, I feel it to be doubly an honor and a privilege to propose that Emergency Pilot Jay Score be accepted as a fully qualified and worthy member of the Astro Club."

"Seconded!" shouted three members simultaneously.

"Thank you, gentlemen." He cocked an inquiring eyebrow. Eight hands went up in unison. "Carried," he said. "Unanimously!" Glancing down at the still taciturn Jay Score, he launched into a eulogy. It went on and on, while Jay sat there with a listless air.

Down at the other end, I saw McNulty's gratified smirk wax stronger and stronger. At his side, old Knud was gazing down the table with a fatherly fondness that was almost fatuous. The crew gave plenty of attention to the subject of the eulogy, and the scanners were fixed upon him, too.

I returned my attention to where all the others were directing their attention, and the victim sat there, his restored eyes bright and glittering, but his face immobile despite the talk, the publicity, the beam of paternal pride from Johannsen.

But after ten minutes of this, I saw J.20 begin to fidget. Don't let anybody kid you that a robot can't have feelings!

THE END.





FISH STORY

By Vic Phillips and Scott Roberts

As a yarn, it wasn't quite plausible, even if it was logical!

Illustrated by Schneeman

"HR-R-RMPH—" Colonel Chutley-Clavenger blasted his vocal chords free of the last cloying remnants of

his liquor. As usual, somebody else had paid for it. "Most interesting, most interesting, m' dear professor.

Undoubtedly the pursuit of the Martian sand gopher would provide considerable entertainment. Found your story most intriguing, most intriguing. But have you ever had any experience in the Nordiff country north of the Magna Escarpment on Venus?"

"Well, no. I can't say that I have," Professor Grey admitted, thereby leading with his conversational chin. Colonel Clavenger's bleary blue eyes lighted up.

"Good . . . er . . . uh, that is to say— Oh, you haven't? Well, now—" We all relaxed back in our chairs. Automatically, the colonel's right hand came out, reaching suggestively for his empty glass. "Very interesting country, that region; probably the most dangerous area in the Solar System—"

We knew this should be good. The quality of the story emanating from the colonel was directly relative to the quantity of liquor poured into him, and he'd been well oiled this evening. We knew approximately what to expect, but Professor Grey leaned forward with eager innocence.

"The last time I was in that country was when I was aid-de-camp to Governor Bly of Venus City during the First Administration," the old liar started. "I was quite a lad in those days—nothing fazed me—had quite a name on Venus, and in the days of the First Administration men were really men.

"Two of them I remember particularly—fine fellows, remarkable men. The three of us made a trio that could literally take the Green Planet apart and put it together again whenever we wished. I remember in particular this expedition the three of us conducted into the dangerous Nordiff country in pursuit of the elusive and highly valuable Porgill."

"Porgill?" queried Professor Grey, wide-eyed, now completely snared.

With one smooth, practiced motion the colonel downed an inspirational snort. "Yes, Porgills are the primary stage in the development of the mature Nordiff."

"Er . . . and the . . . ah . . . Nordiff?" the professor asked doubtfully. He seemed to think he should know. The colonel nodded.

"Remarkable beast, the Nordiff. Somewhat resembles a Terrestrial tree frog, if you can imagine a tree frog eight feet high. Immensely powerful brutes, make a gorilla look like a child—extremely ferocious at certain seasons. They were the hazard of our expedition, but not the objective. We were after the Porgills. Porgill oil is, as you undoubtedly know, indispensable in the treatment of the allergy induced by the spores of the Martian Canal Vine."

"Martian Canal Vine?" the professor inquired vaguely. "I don't recall—"

"Has many other uses, too," the colonel side-stepped neatly. "The Porgills start out as eggs, you know, hatch into two-foot eellike creatures and eventually develop into their mature six-foot length. Their incredibly powerful swimming tail splits to form the hind legs of the Nordiff, their front fins develop into the forelegs. They are covered with viciously sharp spines like the quills of a porcupine. In its raw state, y' know, Porgill oil is one of the deadliest poisons known to science. A single drop on any bare skin can cause a terribly painful death in a matter of hours, and there is no known antidote. The merest scratch from the spines of a Porgill would be the finish of a man. But this did not deter us, although it was by no means the only danger of the expedition."

SEAN FANE originated the idea. Quite a character. One of the fellows we knew as Hill Rats—knew Venus like the palm of his hand.

"It can be done," he said to me. "It'll be risky, but I feel it can be done. If we can just get into the country, snag a couple of Porgills apiece an' get out again, we'll be sittin' pretty for the next ten years. But it'll take real men—that's why I come to you, colonel."

Naturally, I took him up immediately. I was never one to let an opportunity like that slip by, and I recommended a third party, young Don Terry. He was just the man we wanted—a mining engineer. We were all experienced bushmen and took no time at all to get under way. We were well equipped, took a couple of heavy-duty atomic projectors as well as our usual side arms, and a considerable amount of Dutrol, for in that mountainous country you never can tell when it will be necessary to blast one's own trail.

It's hot on Venus, particularly at that season—terrifically hot. We were plagued constantly by the Venusian bush flies as our way led us along the eastern face of Martin's Deep. It was incredibly tough going—nothing like it on Mars or Earth. We finally emerged after a week onto a high, rugged plateau.

"Nordiff country," Sean explained. The high-pitched, maniacal laughter by which the animals warned us off was the only evidence we had of their presence. Three days later we came out of the jungle and sighted the end of our trail. Ahead of us the country dipped down into the tremendous jungle-crammed crater of Porgill Lake. The lake itself was a cumulous plume of white steam that towered up miles away, against the far wall of the crater.

"Well, here we are boys," Sean

said as we stood on the broken, rocky shores of the lake six hours later. "She's a liquid bonanza. All we gotta do is snag 'em and drag 'em."

We whipped ourselves a raft together in no time at all and started out onto the lake. It twisted its narrow, writhing length away from us, green and placid to the mile-high cliffs that surrounded the lake where it cut into the wall of the crater. Steam rose from several points; a vast tower of it billowed at the far end.

Don was impatient to get started, so we put our lines over the side, but the wretched Porgills ignored every type of bait we had.

"Nothing for it but to try an' gaff 'em," Sean decided. "Gol dern, it makes me mad to see 'em swimmin' so placid down there."

It was aggravating, too. There they were, a semitransparent green, hardly distinguishable from the smooth, volcanic mud bottom. There was a school of a dozen or more, each one worth a fortune, and we could see the darkness of their pseudo-skeletons shadowed through their bodies.

Under my instructions, Don rigged a hook on a long pole and plunged it into the depths. We saw it strike home into one of them.

"Got it," Don grunted.

Sean and I gave him a hand. Between us we got the Porgill almost to the surface, then it gave a twist which tore the hook out of the soft blubber and it darted down again to the bottom.

Sean swore volubly. You can understand how he felt. It was so much money slipping through his hands.

"Give me that pole. I'll do better meself."

And damned if he didn't, too. He hooked the next one firmly back of the head. He was a fighter, this one.

Fight! I never saw anything like it. He almost broke the pole with his squirming. Think of it! Six feet of diabolical ferocity, lashing about beside our small raft. The least touch of one of those spikes meant horrible death! Don lost his balance in the tussle and fell overboard. It was a battle of giants. Sean and I stumbling about in our effort to retain the pole. Then suddenly I saw flecks of oil on the surface of the water and I realized our danger. If one of those deadly spots touched us it was all over.

"Let go!" I cried. "Let go; there's death splashing around us!"

I saw Sean pale visibly as his hands reluctantly let go of the pole. Our captive vanished into the depths. The oil patches began to spread their moribund horror over the water and we pulled Don onto the raft just in time!

It was plain that attempting to catch Porgills in an orthodox manner was courting disaster. It was obvious that ingenuity was necessary, so naturally Don and Sean looked to me. Of course, the first move was to explore the lake. We continued along the length of it and came to the end. Here it spread out into a basin some two hundred yards across, surrounded by vast, gleaming walls, towering thousands of feet to the skyline.

The dazzling gleam from the pure white walls prevented us from seeing much of anything till we attached the polaroid screens to our bush hats. Then we could see that the shimmering whiteness was based on solid, black lava. Steam boomed and thundered skyward in vast clouds from the wall opposite the entrance.

"Keep her steady in the middle of the lake here," Sean advised. "Those cliffs are all rotten. Look at 'em, just

hanging together, liable to fall any minute."

He was right. They were falling even now. Small fragments were pattering steadily into the water.

"Let's go over and take a look at that," I suggested.

"I don't like it," Sean said. "We're looking for trouble."

But when he saw that I was determined in spite of the obvious danger, he and Don helped paddle the raft. We came to the foot of the wall. Tiny crystals showered steadily around us. I was just reaching up with a pole to knock some loose when Don yelled:

"Look out!"

We paddled furiously away as a huge mass of crystals plunged down on us. We barely made it. The avalanche struck one end of the raft, sending a spray of water and crystals over us. We managed to stay on board.

"Let's get away from this!" Sean said.

I examined the crystals as he and Don paddled out to the middle of the lake. They had a bitter taste that I recognized instantly.

"Magnesium sulphate," I said. "Those mountainous walls are pure Epsom salts!" I had the first glimmering of an idea.

"Let's go back to camp," Don suggested. "I've had enough of this place."

"Not yet," I said. "First let us examine the source of that steam."

WE PADDED the raft to the south side of the shaft and found a six-foot pool of bubbling lava that was causing all the trouble. It was evidently the last stand of a considerable lava flow that the lake had cooled off and dammed up. I could see in

an instant that it would be a simple matter to stimulate the eruption to greater activity by the judicious placing of some charges of Dutrol.

"There's nothing here that can help us," Don said gloomily.

"Fortune! Right in our grasp," Sean exclaimed. "And we don't dare touch it."

"And we never will be able to touch it," Don seconded. "We might as well forget this whole crazy business while we are still alive. Let's get out of here. I'm fed up."

But Don was wrong. The features of this end of the lake had formed a chain of thought in his mind. There was one vital link missing, however, so I said nothing and let them have their way.

We paddled out of the basin and back down the lake toward the point where we had embarked. Just as we were stepping ashore a sudden gust of incredibly frigid air struck, cleaving through our light, tropical clothing like the thrust of a knife.

"My God, what's that? We'll be frozen," Don chattered.

Sean laughed. "Happens every night up here in the mountains. I've heard tell that the night wind can put ice on a lake like this in less than an hour. We better get a fire going."

I stood stock-still in the icy blast. The idea was suddenly complete. I knew now what we were going to do. I told Don and Sean nothing as we made camp that night. The plan seemed fantastic even to me, but in the cold, gray light of the morning I felt convinced that it was feasible.

Don and Sean were prepared to give up and pull out for Venus City, but I insisted that they accompany me once again to the end of the lake. I told them nothing of my thoughts, but such was their confidence in my resourcefulness that they came without question, although they must have wondered why I ordered them to load both our heavy-duty projec-

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tors and all our Dutrol on board the raft.

My subsequent action served only to mystify them further. I told Don what I wanted, and he, using his knowledge as a mining engineer, directed the placing of charges of Dutrol around the lava vent. We also circled the base of the cliffs surrounding the great arena with a continuous ring of judiciously placed explosives. We had several extremely narrow escapes during this latter operation, but luck was with us. On one occasion a huge mass of crystal thundered down, missing me by a hairbreadth, but, nothing daunted, I carried on till we had finished the task. It had been hard, dangerous work, and were dead tired when we returned to camp.

"I don't see the sense of all this," Don complained. "I wish you'd tell us what's in the back of your mind, Clavenger. How's this going to help us catch Porgills?"

Sean backed him up. "That's right. I reckon we ought to know what's going on."

But I resolutely refused to tell them of my plans. I was not sure enough of them myself. However, I managed to restore their confidence. There was no time to be lost. This was dangerous country in which to linger. Any time now the mating season for the Nordiffs would begin, and this lake, where they laid their eggs, was the focal point of their activities. Once the mating season started we would be in the deadliest peril, for, during this time the bull Nordiffs ranged through the jungle, killing every other type of wild life they came in contact with.

IN SPITE of the protests of my two companions we worked all that night by torchlight, cutting lengths of thick, porous vines and lashing them

into rafts. Before morning we had launched a veritable armada, a sizable task for any three men, and I must admit we were a little tired.

Just before dawn I fired the charges we had planted around the lava vent. A tremendous, continuing rumble of sound told me that that part of my plan was working, the lava was flooding into the lake.

Both Sean and Don wished to rest with the coming of daylight, but I drove them inexorably. By noon we had anchored all the rafts in the positions I had selected. The water was getting hotter all the time, and Don thought he realized something of what I planned.

"You are going to kill them by boiling," he said triumphantly.

"No, that won't work," Sean said. "Heat don't hurt them critters none. They like swimming around right next to that volcano."

"Exactly," I agreed. "That is not my plan at all."

"Then what the devil is it?" Don demanded.

"Perhaps this may tell you something," I said as we went ashore and I used the radio detonator to fire the charges we had placed around the bottom of the basin walls. The blast released a tremendous, crystalline avalanche that roared down into the far end of the lake.

"From here on it's up to the weather," I said, but Don still didn't understand. We spent the rest of the day building a shelter of lava chunks, then waited for the wind.

It came, shortly after dusk, heralded by a low, moaning wail from the tops of the mile-high cliffs surrounding the lake. It increased steadily in power until it was a deafening roar all around us. High above we could see great tangled masses of jungle torn from the cliff tops and swept overhead in the screaming

gale. The darkness of the storm swallowed up the last of the lingering daylight. Then the lightning came—a long, shuddering blast of light that seared across the whole vast, mad sky. The harsh, shattering rip of thunder slammed the darkness back.

We could feel the cold seeping in on us and rolled into our sleeping bags for warmth. We were so exhausted that we slept like babies in spite of the noise and cold.

The cold awakened me shortly after dawn. The storm was still going full blast. I fought my way down to the edge of the lake. Everything was just as I had expected. Sean and Don swore as I roused them, but sleepily followed me down to the lake. The wind whipped spray freezingly over us.

"What's the big idea?" Don growled. "Have you gone crazy?"

"Patience, my young friend," I advised. "We are now going to catch Porgills."

"How are you going to do that in this storm?" Sean demanded.

"Look there," I said, and pointed to what appeared to be a log pounding around in the edge of the surf. I waded in and heaved it ashore. "That's how we'll catch them," I said triumphantly. Don and Sean gazed down at the object in stupefaction.

"It's a Porgill!" Sean gasped. "Parceled up as neat as you like!"

"What happened to it?" Don demanded. The deadly spines and poisonous oil of the Porgill at their feet were sealed harmlessly within a gleaming tomb.

"It's very simple," I explained. "I merely used these magnesium sulphate cliffs, the volcano, and the wind to create a lake of supersaturated solution."

"I still don't get it," Sean exclaimed. "How did you know the critters would get cased up like this."

"Matter of elementary chemis-

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try," I told him. "The waters of the lake, heated by the volcano which I had excited, were charged with a tremendous quantity of dissolved Epsom salts. Now the wind has cooled the lake and the water cannot retain the salt in solution. As you know, anything that moves in a supersaturated solution is immediately surrounded by crystals. Come, there is work to be done."

Enthusiastically we paddled out to the first of our anchored rafts and started pulling in the Porgills that kept rising to the surface in ever-increasing numbers, locked rigidly helpless inside their crystal mummy cases. We labored all that day and far into the following night before we had loaded our last raft to the point of foundering with a tremendous fortune in Porgill oil.

As we clambered ashore, a dim figure rose before us, its red eyes burning with maniacal ferocity. Instantly I knew it was a bull Nordiff.

"Watch out!" I screamed at Don as he unsuspectingly scrambled up the beach. With a roar, the enraged creature charged at him. With unwavering precision I fired from the hip; the projector flamed. The headless body of the Nordiff fell on top of Don. Frantically we dragged him clear.

"We've got to get out of here," Sean shouted above the wail of the storm. "The Nordiffs are on the march!"

Hastily we gathered our equipment and fled into the jungle. Time after time we encountered bands of Nordiffs. With our heavy-duty projectors we slaughtered the beasts by thousands, but they gave us no rest, surging again and again to the attack. Through it all I led the way, unerringly back to Martin's Deep. Here we fired the jungle and closed the trail behind us. At last we were safe.

Two days later we were back in Venus City and had dispatched a ship to haul the captive Porgills into the city.

"AND that," concluded the colonel, "finished one of the most exhausting fishing expeditions I ever took part in. It was days before we got the saltiness out of our throats— Thank you, straight this time. Eh? What? The bar is closed? Blasted officiousness!"

The colonel rose to his feet indignantly. "Glad to have met you, professor. Most enjoyable evening."

"One moment, colonel," interposed the professor. "You must have made a considerable amount of money out of that expedition—"

"We did. Most certainly we did. But the price of refreshment as it is— Good night, gentlemen."

"You know," said the professor doubtfully, "I can't remember precisely whether crystals do float in a supersaturated solution."

THE END.





SUBCRUISER

By Harry Walton

The suberuisers were dangerous enough without a drunken skipper and a treasonous mate!

Illustrated by Schneeman

THE first thing he recognized on waking was his cap dangling alongside the chronometer. Delft blue parma cloth, black plastoid visor, gold band with "S.S.C. W-13" im-

printed in black, and centered above the single gold star of a captain in the subspace cruiser division.

He sat up, groaning softly with the ache in his back. The chro-

nometer said eleven forty-two, but that meant nothing to him. He remembered stopping with Sanger at the Golden Rocket. They'd started with a couple of drinks, and probably he'd taken enough to pass out. Sanger must have taken him back to the ship. A good first officer, Sanger. But it was easy to depend too much upon a first.

Especially after Wilkins and the *W-6*.

He'd have to brave up before going out on patrol again. At this rate, he'd soon be reduced to an ensign. This was war; the Venusians had killed other good men besides Wilkins. That Terra was holding out was due chiefly to the defense patrol and the sub cruisers; there was his job and the *W-12* to be handled.

But right now he felt like the devil. Head ached, mouth tasted like the inside of a blast tender's glove, and he felt as limp as if he'd been sandbagged.

Right now he'd be willing to spend the rest of his liberty time flat on his back.

Captain Paul Wythe closed his eyes, sank back in the bunk. Confused, chaotic thoughts drifted through his mind. It had been hard to think straight, ever since the *W-6*. But why think at all, with the ship cradled at Base?

His eyes jerked open, and he sat up abruptly, the movement sending pain shooting through him. The chronometer still meant nothing. What had bothered him was that the night light's glow wasn't steady. It pulsed a bit, although fed by a perfectly smooth D.C. source. Only cross-induction between the lighting mains and the Rexdallian converters ever caused that 20-cycle pulse.

But the Rexdallians wouldn't be running if the *W-12* were at Base.

His feet hit the floor with a bang. Weaving slightly with dizziness, he staggered through the corridor to Central Control. From their subcruising stations before inductance rheos and trimmer condensers men stared at him briefly, faces rigid with discipline, but eyes openly expressive of contempt. Sanger was bending over the subscope plate.

Wythe clung to a manifold to keep from teetering. "Lieutenant Sanger! Please report to my quarters."

The first's head snapped up. He stared at Wythe with unconcealed concern.

"At once, sir." In three steps he was at Wythe's side, offering him the support of an arm. Wythe saw Belinson, at the trim meters, turn away with a grimace.

Back in his room, he was obliged to sit down.

"Please explain your taking over, lieutenant," he said. "Also why you didn't see fit to call me."

Sanger stood respectfully at attention. "It seemed very necessary, sir—the Golden Rocket, you know. A messenger found us there, with orders for special patrol, replacing the *M-32*. You . . . you didn't take any notice, sir. I signed for the orders—"

He hesitated, obviously embarrassed.

"For God's sake, Sanger, are you telling me I was drunk?"

"Well—it's understandable, sir—you were a close friend of Wilkins. I got you aboard without trouble."

"Damn!" breathed Wythe. "I don't remember drinking that much."

"No harm done, sir. Everything's humming. You have only to take

over when ready. Hope I did the right thing—”

Wythe groaned inwardly. Too drunk to sign for his own orders!

“Thank you, Sanger. Sorry to have caused you trouble.”

“None at all, sir. Any orders?”

Wythe looked up at the lieutenant's trim figure, buttons agleam against the neat blue uniform, cap right, eyes gravely respectful.

“Yes. Don't . . . don't help me before the men. If I can't stand on my own feet, let me drop. I—damn it, that's all.”

Sanger's hand snapped to his visor. He about-faced, vanished.

WYTHE GULPED DOWN a double bromo, stared into the washstand mirror. He was a year older than Sanger, looked ten. A day's growth of beard blued his jaw. His hair was tousled—he'd gone before the men without his cap, he suddenly realized. Eyes were bloodshot and smarted badly.

He bathed his face with ice water, combed his hair, cursed because it was impossible to shave, and went back to Central Control. The men didn't even glance at him this time. Tense as always during subspace operation, when their lives might depend upon a split-second decision on the part of a potential trimmer, they kept their eyes upon the instruments as Wythe crossed the C.C. deck and climbed stiffly into the observation turret.

Plastoid ports showed only the dead, tangible blackness of subspace; Sun, stars and planets were snuffed into nothingness. Somewhere nearby Terra rolled around the Sun, but for all the eye could tell might have been a million parsecs distant. In fact, while in subcruising trim the *W-12* could have pierced the Earth from pole to pole without effort be-

yond some quick adjustments on the part of her trimmers. The laws of three-dimensional space, suspended between herself and normal bodies, were maintained for ship and crew by the artificial space field created by her Rexdallians.

No blaze of rockets marked the tail flare; the *W-12* swept stealthily along on kinetic polarity plates, powered by batteries under the engine room.

Wythe cut in the turret detectors, watched red needles swing to negative indication as the detector screen began its three hundred sixty degree swing. There were similar detectors in the C.C., upon which Sanger would note the presence of enemy craft. The turret watch was superfluous, but Wythe preferred it to the alternatives of crawling back into his bunk or standing watch with Sanger under the contemptuous eyes of the crew.

Minutes passed. Patrol was a routine business—cruise until batteries were half discharged, then return to normal space operation by rockets while turbo-generators recharged the batteries. Then back to subcruising again.

A flickering needle snapped Wythe to attention. Red arrows quivered to rest as the automatic screen swung to indication. Venusian twelve thousand miles to port. Wythe snapped on the interphone. Sanger would be giving orders to come about.

The phone was, incredibly, silent.

His head pounding, Wythe wondered whether he were fully awake. But the indication was as definite as a ten-inch shell. He leaned toward the phone, then realized that Sanger was in charge of the C.C. and, therefore, of the ship. To give orders from the turret would result in ragged, doubtful obedience.

Wythe crawled back into Central

Control, stopping beside the helmsman to note their course.

"Bear port fourteen points," he ordered.

Sanger snapped erect at the words. "Steady as you go, helmsman." His eyes met Wythe's apologetically. "May I speak to you, sir?"

Grimly Wythe crossed the C.C. and looked at the detectors beside the subscope plate. The needles lay dead against the pins.

"I think you'd better explain, lieutenant," he said harshly, "why your detectors are dead and why, with a Venusian off our port, you tell the helmsman to ignore my order to change course."

The first's eyes flashed resentment. "If the captain will read his orders, he will find instructions to ignore enemy ships until the *W-12* reaches a certain special objective."

Wythe felt a slow flush mount to his face. He'd presumed from Sanger's remarks, that the orders were the usual patrol instructions.

"I shall read them now," he said quietly.

Sanger's upper lip, with its small blond mustache, twitched slightly. "In my quarters, captain."

WYTHE preceded him, certain of following stares, but glad that Sanger offered him no help this time. He accepted Sanger's invitation to sit down in the tiny cabin. Standing, even under fifty percent artificial gravity, rapidly tired him.

"I realize I should have acquainted you with the orders, sir," said Sanger, once more respectful, "but didn't care to trouble you needlessly."

Wythe met the man's pale-blue eyes. "You concern yourself needlessly, lieutenant. I am still captain of this ship."

"Certainly, sir. Sorry if I over-

stepped my duty. Your orders—"

Wythe took the sheaf of pages, leafed through them rapidly. Routine forms, with a brief typed note ordering him to take over the patrol duties of the lost *M-32*.

"There's nothing here about ignoring enemy ships or a special objective," he protested. "You will—"

Further words stuck in his throat. Sanger was facing him over the thick barrel of a neuro-cerebral paralysis gun.

"You will be incapable of giving further orders," murmured the first officer, "because of a very obvious disability—the men are witness to the fact that you can scarcely walk straight."

"This is mutiny! Are you crazy, Sanger?"

"Hardly. You see, captain, the *W-12* has a special objective, although not one assigned by Terra's Base."

"So you're acting for Venus? You'll never make it, Sanger. My crew—"

"My crew," the first interrupted softly, "has confidence in me—but none at all in you, captain. They will believe whatever I tell them. For weeks you've given a convincing performance of a brilliant commander going to pieces—you can hardly expect the men to be surprised if you keep to your quarters. Naturally, I can't allow you the freedom of the ship—"

"You mean to turn this ship over to Venus? For Terra's sake, Sanger, think! Subships are our ace—if the Venusians learn to build them we're sunk. They'll be able to bomb the daylight hours out of both hemispheres. You're an Earthman, Sanger. Give up this scheme and we'll forget the incident, I swear. You'll go up in the service—my word on it."

Sanger shook his head. "A touch-

ing offer, captain. You offer me the chance to continue risking my life for Terra! Venus has rather bettered your price—but I've got to get back, or the men will begin to wonder. Know anything about paralysis guns? They're very effective, and harmless—I'd hate to kill you, captain. You're worth far more alive. So I'm going to beam you at quarter charge. Think carefully. If, when you come to, you decide to call for help, the beam will be set for full charge next time. By the time others see you, you'll be paralyzed—with an open bottle of liquor spilling over your uniform. Your condition will answer all questions. And now—"

From the gun issued a blue flash. There was no projectile, but Wythe felt suddenly as though he had been clubbed. His muscles were rigid, there was a fiery prickling around his heart, his pounding headache was mercifully dulled. He saw Sanger lift him into the bunk, straighten his legs. Then the first officer closed his eyelids and Wythe could see no more, but he heard the door close, the lock click.

He could not judge how long he lay there. At times it seemed hours, then again only seconds since Sanger had left. The confusion of time sense was characteristic of gun-induced paralysis.

But he was bitterly capable of thought. Sanger meant to deliver the *W-12* intact to Venus; by dismantling the ship the enemy would learn the vital secrets of the Rexdallian generators. He, as captain, was to be delivered with the ship. Under hypnotic serums he'd tell all he knew about its construction and operation. Soon Venusian-built sub-ships would be laying waste the Earth.

Sanger didn't want to attack the

Venusian apart, not because of any sentimental regard for his allies, but because the *W-12's* first shot would register upon the other ship's resonance detectors and bring about Sanger's ears a barrage of neutronium mines. He had nothing to gain either by taking that risk or by blowing up the Venusian. Probably he had a rendezvous with a disguised enemy cruiser. Under pretext of a "special mission" he could lay alongside the stranger and allow armed men—Venusians—to come aboard. The *W-12* would probably be taken without a shot.

Better for them all, better far for Terra, if the enemy ship just apart blew them to fragments.

But Sanger would dodge Terrestrial and Venusian ships alike until he reached his rendezvous with Venusians who would recognize the *W-12*.

It was as much his fault as Sanger's, Wythe told himself fiercely. Since the *W-6* had been crushed before his eyes he'd drunk too much, depended upon the first too much, allowed himself to lose the respect of his men. His authority had been undermined until Sanger was the real master of the *W-12*.

WYTHE'S EYES suddenly opened, although for a time he could not move the pupils, and had to stare at the fluorescent ceiling bulb fixedly. Gradually he regained control of his facial muscles, arms, and legs. At last he was able to rise stiffly, rub his aching limbs, and try the door.

It was locked, of course. Whoever heard his call for help would have to get Sanger to work the lock combination, and somehow Sanger would get rid of witnesses long enough to set the stage as he had threatened. And that would be that.

By Sanger's chronometer the paralysis had lasted only twenty

minutes; the Venusian caught by the detectors couldn't be more than fifteen thousand miles away, was probably listening for subships on its resonance detectors. Operating on batteries, the *W-12* was practically undetectable, for the Rexdallians didn't register on resonance detectors. But loose connections, an arcing battery plate, or an unshielded motor operating in defiance of regulations frequently did betray subships to a listening enemy.

Not likely that Sanger would allow any stray spark oscillations to go out from the *W-12*. No operating center, not even the crew's quarters, would escape his watchful eyes.

Except this room, his own!

Desperately Wythe looked about for something with which to accomplish his purpose. There was no fan, only a circulation register. Sanger's razor? Electric shavers sparked abundantly; their use was forbidden during subspace operation.

Wythe yanked open the cabinet over the sink. On a shelf lay an archaic straight razor. Sanger shaved with brush and soap!

The outlet beside the mirror could be short-circuited with the wire clip pinned to the order folio. But there would be only one spark before the circuit breakers opened, and even if the Venusians caught it, it would yield no accurate bearing indications.

There remained the lighting fixture. Wythe dragged the chair under it, let lamp and socket dangle after unscrewing the mounting rim, and bent one wire back and forth until it broke. The bulb winked out. By touch alone he brought the severed ends together. The lamp flashed on and off and a small spark snapped repeatedly as he plied the wire.

It was only a seventy-watt spark. Such a small fluctuation wouldn't

show on the switchboard; the great danger was that somebody might notice the flashing through the door transom.

For five minutes he continued, fuming as it became apparent that the Venusian was taking no notice. The spark's amplitude must be too small to register fifteen thousand miles away—

The door lock clicked suddenly.

He left the room in darkness as the door opened, Sanger's figure a black outline against the corridor light, the paralysis gun ready. From chair height Wythe jumped him. The shock hurled them both to the floor, and at once they were locked in a silent struggle for possession of the weapon. Every latent pain in Wythe's body seemed to spring alive as they thrashed about. Pain rocked his senses as Sanger knocked his head viciously against the floor. Strength ebbed as a gray tide of unconsciousness threatened to roll over him, and he was unable to keep the gun from coming around to bear on his chest.

A sudden shock, like the blow of a giant sledge, rocked the *W-12* under them.

Neutronium mine!

It had gone wide, but there would surely be more, deadly little neutronium spheres, given a negative energy charge that revolved them into subspace at a predetermined time after launching. In subspace, neutronium disintegrated violently, setting up a shock wave that could be fatal to a subship a hundred miles away.

Sanger suddenly scrambled free, took aim, and fired point blank at Wythe. But a second shock thrust the *W-12* hard over, spoiling his aim. Wythe felt a hammer blow in his left shoulder, and at once went rigid. For a moment Sanger stared at him, then ran toward the C.C.

WHEN SANGER was out of sight Wythe groggily got to his feet. The beam hadn't hit a nerve center; only his left arm was useless. He felt the deck lurch as the ship came hard to starboard. Sanger was trying to outrun the mines. The next shock was feeble. Then came a shudder of a different sort as the *W-12* showed her teeth with a barrage from her stern guns. The explosive shells, hurled back into normal space by a Rexdallian vortex field at the instant of firing, could pierce the heaviest armor the Venusians possessed. Evidently Sanger felt that his own salvation now depended upon destroying the enemy ship, but the firing of his magnetic guns was sure to betray his location still more accurately.

With grim satisfaction Wythe felt the Venusian's reply—two severe shocks. The disintegration waves, spread through the rigid continuum that was subspace, struck the *W-12* like steel hammers.

He dragged himself to the C.C., watched Sanger hurl orders from his post before the subscope. Men, fighting for their lives, paid Wythe no attention as he approached the first officer from behind, intent upon securing the paralysis gun. Upon the viewplate appeared the slender Venusian ship, mine discharge tubes aglow at her stern. She was aiming, of course, by detector coordinates. But whereas the rigidity of subspace made a "hit" anywhere within a hundred miles dangerous to the *W-12*, Sanger's own fire could score against the enemy only with a direct impact.

A tremendous blow almost stood the subship on end, knocked Wythe sprawling. Sanger bellowed into the interphone, and again came the shudder of the *W-12's* stern guns. Wythe dragged himself erect and

again approached Sanger. On the viewplate he saw that the Venusian was still launching mines.

A splash of blinding light, suddenly, where the slender, thousand-foot hull had been—come and gone within a hundredth of a second, although its searing impress remained far longer upon the retina.

Within the range of the subscope not even wreckage remained. A shell must have burst inside the Venusian's fuel tanks.

In rapid succession four shocks hammered the *W-12* as mines, fired just before the enemy ship had been struck, exploded. There was a breathless pause—then a fifth shock, a terrific impact that wracked the cruiser from bow to stern.

Wythe saw the floor roll up, then felt himself sliding to starboard in a tangle of men. The lights winked out; he brought up in pitch darkness against something soft. Groping hands brushed his face. Then the emergency bulbs lit dimly, and by their feeble glow men struggled to their feet. One dangled a broken arm. Wythe looked for Sanger and found him crumpled against the forward bulkhead, blood oozing from his scalp.

"Park and Benson, attend the wounded," Wythe ordered. He limped to the commander's post, addressed the interphone. "Report casualties."

There was no answer at first.

"Engine room reporting, sir," the electrician's voice came through. "I think the stern gun room was wiped out."

"How do we stand, Elston?"

"One Rexdallian's gone. Jackson's putting out a couple of flash-overs in the battery room. Rexdallian draw is pretty heavy."

"Check," said Wythe. "Forward gun room report."

The voice that answered was harsh with strain. "Two men killed by a squeeze forward. Our shield's failing four inches a minute."

"Abandon forward gun room," snapped Wythe. "Elston, cut out the forward shields as soon as Falk reports clear. Shut down your kinetic drive. Emergency lights only. Save all the juice you can."

He received acknowledgment, saw that Sanger and the other wounded man had been taken to quarters. The others were watching him curiously. He checked the detectors again. Nothing registered. It would be safe to return to normal trim until all the damage was checked and repaired and the depleted batteries recharged.

"Stand by to trim off," he ordered. "Elston, you ready?"

"The Rex's are hot, sir," the electrician responded doubtfully. "There will be an overload, with the shorts we have."

"They won't get any cooler. Trimmers stand by—"

Wythe looked around in amazement. The men weren't at their stations, but gathered around him in a tight little knot of scowling faces. He felt his own gaze falter before theirs. They knew him for a drunken incompetent. Under his leadership they were no longer a crew, but only seven men with the spark of rebellion smoldering in them, and fear feeding its sullen fire.

"What's wrong, Park?" he asked quietly.

"We'd rather not go normal, sir, until Lieutenant Sanger can take over," the man answered bluntly.

Wythe looked from one set face to the next, forcing himself to meet their stares squarely. "Nevertheless, you will take your stations to trim off."

Nobody moved.

"We're afraid you'll blow the Rexdallians trying," Park blurted.

"I've weighed that risk," said Wythe icily.

"Yes, sir, but if Lieutenant Sanger—"

"The first officer is to be considered under arrest. So will any man be who is not at his station when I give the order to trim off."

Sullenly the group dispersed, at last stood ready, if unwillingly so, for the effort of expanding the artificial cocoon of normal space surrounding the *W-12* sufficiently to overbalance the negative energy potential of subspace and return the vessel to its normal medium.

"Stations attention," Wythe ordered crisply. "Trim off—"

From beyond the bulkhead came the rising roar of Rexdallians pushed to their limit. Emergency and instrument lamps dimmed with the terrific drain of current from spent batteries. Before Wythe's eyes shield amplitude indicators crept up as the converters fought back the encroaching substratum. Men were rigid with the concentration of those who literally hold their lives in their hands. But Wythe's indicators moved steadily toward the green line of safety that marked conversion potential. Seconds more—

A SCUFF of sound, where had been taut silence, brought Wythe's head around. Sanger stood in the doorway, a crooked grin on his face, the paralysis gun lifted. No one budged. And as the *W-12* hung upon the very threshold of safety, Sanger fired. A trimmer swayed, fell stiffly, locked fingers spinning about his condenser control before they tore free.

The roar of Rexdallians at once became a shriek, that ended abruptly

with the crash of opening circuit breakers. Without warning emergency bulbs flickered out. From out of the darkness Elston's voice rang urgently.

"Half the C.C. shields burnt out, sir. Can't hold the rest more than thirty seconds."

"All hands to the engine compartment," Wythe ordered. "Park, see that your casualty case is brought along. Sanger, you'd better come, too."

A pale beam of light shot across the C.C. Benson had found a battery lamp. He and another man lifted the paralyzed trimmer. The lamp swung from Benson's wrist, shot random light upon familiar controls and instruments, which probably none of them would ever see again.

Upon the ceiling plates forward a black spot was spreading rapidly.

"Squeeze!" Wythe announced. "Hurry it." He counted seven men through the bulkhead door. "Last chance, Sanger!"

Darkness and silence mocked him, then a brittle snapping as a stress-beam gave way before the squeeze. Wythe flashed around the lamp Benson had left him. The C.C. looked ghostly; the black pall of disintegration was spreading swiftly. He entered the engine compartment, dogged the door shut behind him.

Two small bulbs threw huge the shadows of silent blast turbines and alternators. With Elston, Wythe inspected the Rexdallians, one silenced forever when a disintegration wave had struck the gun room shield and fed back. Its armature was half disintegrated. The other two were running hot.

"Think they'd carry a normal trim load now, Elston?" Wythe shouted above the racket.

"Not overheated like they are, sir. That potential warp we had nearly blew them. And they ain't

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cooling—we've got shorts in the engine room shield, and every one of them takes ten times the juice a good unit would, without carrying any pressure. We can't shut down one Rex at a time because with all those shorts it takes both to carry the load. They'll just about hold up until more shields break down."

There was no more to be said. Those who had listened to Elston's ultimatum turned away with a fatalistic calm and sat down wherever they could find room. Some closed their eyes, others stared apathetically into space. Wythe could think of nothing to tell them, but he was unable to share their stolid resignation. He felt tinglingly alive now that death seemed close.

Elston had said "until," not "unless." It was inevitable that more shield units, some of them probably already damaged, would fail. How long? Should he, Wythe, put to a vote the alternative of opening the shield circuits? It would be over quickly—

He paused before the roaring converters, their hot blast in his face. The atmosphere was stifling, for coolers had been shut off to save energy. Like the men, he was sweating profusely.

The ammeters showed a tremendous drain. Obviously current was pouring into short-circuited units, but as the latter were wired in banks, it was impossible to cut out one without cutting out several, which would immediately result in a squeeze. Nor was it possible to tell, from within the ship, just which were the damaged units. Affixed to the outer hull as their purpose required, they were replaceable only from outside the ship.

Wythe beckoned Elston to him. "Break out your spare units. We'll replace the bad ones."

"From outside? My God, sir, you can't ask a man to try that. There'll be more going any minute."

"I'm asking no one," Wythe retorted. "Get me the units."

Elston hurried off. The quartermaster, Park, arose and approached Wythe. "I'm willing to try it, sir."

"Thanks, Park. We'll both go—there's no time to lose."

THEIR PREPARATIONS were simple—the spare coils hung about their shoulders, heavy rubber gloves on their hands, a flashlight fastened to one wrist and a terminal wrench to the other. Nobody spoke as the outer hatch was opened. Eardrums snapped with the drop in pressure as air rushed out to fill the space shield. In normal space the opening of the hatch would have been fatal, but here air could escape only to the extent of the static membrane dividing space from subspace, an inflexible "skin," rigid as subspace itself, impermeable to matter, yet utterly dependent upon the REXdalian shield for its existence. It was this membrane that prohibited the use of rockets or blast turbines, the exhausts from which would build up an external pressure, crushing the ship.

Along the hand grips Wythe crept up the curved hull. By their own faint glow he could see the shield units, extending in a narrow girdle around the ship—a girdle the width of the engine room. Where their pattern was broken were the burnt-out units. He threw the beam of his lamp along the hull. Fore and aft darkness engulfed the light. The proud length of the *W-12* was no more. This maimed midsection was all that remained of the trim sub-ship.

Wythe tore the feed wires free from the nearest dead unit. They

came away with a blazing red arc. He ripped out the shorted coil, bolted down a new one, and connected it. Twenty feet away Park was similarly busy.

On his eighth replacement Wythe noticed, from the corner of his eye, a brief upflare in the glow of a neighboring unit. Instantly he flung himself flat as the glow went dead. Gingerly he drew his knees up under him, and found hips and chest were pinned close to the hull by the static membrane, which had formed anew only a few inches above the plates when the nearby unit went dead, and was now maintained by the thin, overlapping field of surrounding units. Had he not fallen flat he would have been decapitated by the sudden collapse of the old field.

Wriggling desperately, he struck his head a solid, mind-shattering blow against the empty blackness above. For a moment he lay quiet, recovering from nausea. The pressure on his chest robbed him of breath. Trying again, he found he could not move an inch.

Then, cursing his stupidity, he realized he could open the vise that held him simply by replacing the defective unit two feet away. Savagely he tore it free, jammed a new one into place. The instant it was connected the relentless pressure upon him lifted.

From then on he lay flat and crawled from unit to unit. Two more winked out while he worked, but at some distance from him. Park had worked his way downward under the battery room, and was out of sight, when four blows rang against the hull from within. Wythe tapped an answering signal with his wrench.

Before crawling back he flashed his lamp over what had been the

C.C. bulkhead, now aglow with emergency shield units. There was, of course, no more Central Control. Hull plates ended in smooth edges eighteen inches from the bulkhead.

Wedged down there between a girder and a manifold was the inert body of a man.

Sanger! The first officer must have reached the safety of the bulkhead shield at the last moment, either to make a last bid for life—or to take the others with him to death by wrecking the shield units.

WYTHE crawled down the manifold. Sanger's eyes were closed; his left arm had been cut off by the collapse of the C.C. field. A slow jetting of blood from severed arteries told Wythe that the man was still alive. He pulled the limp body free, wriggled with it across the narrow ledge that was left of the floor plates, and pounded upon the bulkhead door until Elston opened.

"Park is safe, sir. Glad you're back—one of the Rex's is pretty bad—"

The electrician stopped. Others crowded forward to stare tight-lipped at Wythe's burden.

"Benson, see what you can do for him," he ordered. "We'll look at the Rex, Elston."

In the roar of one converter there was an ominous undertone. Its chrome beryl bearings were a dull red. Smoke wreathed its whirling armature, and the air stank of overheated varnish.

"The other ain't so bad," Elston explained, "but this one took most of that potential warp load forward."

Wythe considered. The shaft would seize any moment; the sudden stoppage might strip the armature clean.

"We'll shut this one down—at once," he decided. "Take a chance

on the last one carrying us, now that the shorted units are cut out. We'll let this one cool, then use both, and the rest of our power, to pull back to normal trim—"

He had had to shout to make himself heard above the drone of the machines, and now he saw the eyes of every man upon him, felt the sharp impact of fear-ridden thought. To cut out one converter would leave a shield extending scant inches from the hull—thinner still between units—and anywhere the possibility of a squeeze.

They watched tensely as Elston gripped the switch, and at a nod from Wythe, pulled it. Instantly the hum of the single converter still running settled to a deep-toned roar.

From Elston, whose eyes turned anxiously toward the overloaded machine, came the dread cry: "Squeeze portside!"

All saw it then—a food-wide patch of darkness etching the hull plates beside the last REXdallian with the stamp of disintegration. Silently the little group watched it swell into a bulging, dead-black semisphere, creeping ever nearer the vital converter.

"More power," snapped Wythe. "Get that Rex up to speed—quick."

Deeper swelled the drone of the overloaded machine as Elston stepped up its output. With inward relief Wythe saw that the effect was what he had scarcely dared hope for—the converter's own eddy field was holding the black semisphere at bay, flattening its rounded inner outline where the force fields clashed.

BENSON broke the silence. "Sanger's lost a lot of blood, sir. Take a transfusion to save him. He wants to talk to you."

Wythe knelt on the floor grids beside him. The first officer's eyes

were clear, frank with the conviction of death.

"Benson says you brought me in," he murmured. "Thanks—but I'll go this way—rather than court-martial. How are things?"

"Tough," Wythe told him. "Beginning of a squeeze, but we aren't licked yet."

"Sorry, captain—about everything."

"As much my fault as yours," said Wythe gruffly. "Shouldn't have let the *W-6* thing get me down."

"That wasn't it," whispered Sanger. "Only my chance . . . to act without making you suspicious. Not your drinking . . . drugs. In your bromo, in food. Just enough to weaken you, knock you out. I didn't want you cashiered though . . . didn't want Base to appoint a new captain."

"I was drugged at the Golden Rocket?"

"Yes. Ethyl alkaloid tablets. Made you feel and act drunk. So I could take over. Sorry . . . good luck."

Sanger's eyes closed. Benson, who had been standing by, stooped quickly.

"He's done, sir."

Wythe nodded. A great weight had lifted from his mind. He turned back to the roaring converter, which was rapidly heating up. Its current drain, registered on the ammeters, was enormous. The battery indicators stood at twenty percent charge, but it seemed to him that he could see the needles fall. A simple calculation told him that ten minutes more at the present drain would drop the batteries below discharge potential.

Ten minutes! And the second REXdallian was still far from cool.

Twenty percent charge—scarcely enough to bring two converters to

normal trim output—and that slender reserve falling every moment.

To re-establish the second converter's field alone would take two percent. Two from twenty left eighteen.

The men were watching him, but he knew he could not keep the truth out of his eyes. It was hopeless; they'd gambled with subspace and lost.

He looked at the drawn, tense faces of his men. There was calm, without bitterness, in the few glances that met his own. Also—and he thrilled at this—no hint of blame for his part in catastrophe.

His thoughts churned rebelliously. This couldn't be the end; there must be one more thing they could do. But what, with just so much juice in the batteries and no way to get more? If only they could start the blast turbines—

Deep within him an incredible hope expanded. The thing was impossible—but if it could be done they'd live!

"Park, take three men and douse that Rex cool," he ordered. "Check your blast turbines, Warren. Elston, I want the generators directly connected to the Rexdallians. We're using the turbines."

Warren said slowly, reluctantly: "Aren't you forgetting the back pressure, sir?"

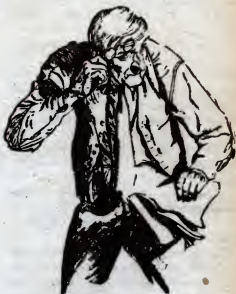
"I haven't forgotten," snapped Wythe. "Get busy."

It was eloquent of his new mastery that they obeyed. He ordered a collision mat broken out and stationed two men beside the squeeze with clamps and jacks.

"You'll have to work fast," he told them. "When the other Rex cut in, the overlap from other units should kill the squeeze. Cover the hole, but secure it against outside pressure—"

Three minutes later preparations

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were complete. Amid a taut silence men faced him.

"This is it," he said quietly. "It'll be over—one way or other—in sixty seconds. We'll cut in both converters, expanding our shield as if for normal trim. We haven't enough juice to make it, but when Warren sees that squeeze disappear he'll cut in the turbines. Sure there'll be back pressure—but the turbines will be feeding the Rexes, the shield will be expanding, and we'll bet that it expands fast enough to take care of the exhaust. If it doesn't, we have nothing to lose. Ready?"

"Reckon we're all with you, captain," drawled Park.

Wythe nodded. Elston flung up the switches. The second converter took up its burden while ammeters dipped to full drain indication. Warren stood by his ignitors, eyes riveted upon the squeeze. Suddenly a cheer went up. The sphere had vanished; the mat was hurled over the gaping hole it left, and a new roar filled the engine room as Warren lit off the turbines.

This, Wythe knew, was the crucial interval, before the turbines came up to speed and actually delivered current to the laboring Rexdallians. Would the outside exhaust pressure build up against the static membrane meanwhile enough to stall the turbines or crush inward the walls of the engine room?

Somebody coughed as blue exhaust fumes puffed in past the col-

lision mat. The whine of the turbines sank from its normal high pitch as back pressure battled the exploding fuel. Anxiously Wythe watched the plates for signs of bulging.

Abruptly the mighty roar of the Rexdallians broke, thinned to a low hum as they ran free. The drone of the turbines rose suddenly to a scream.

Tense faces broke into grins. Elston cut out the converters. "We're through, sir—normal!"

A gigantic voice that seemed to rattle off the very hull plates interrupted him.

"W-12! What the devil d'you mean by going normal practically under our keel? Answer up, W-12."

That would be Bronson of the W-4, talking over a sound beam, Wythe knew.

"Wythe speaking. Can you hear me?"

"Certainly. Want a tow back to Base?"

"Guess we do. We're slightly damaged."

A metallic snort rattled the ship. "Slightly damaged? You're practically annihilated!"

Wythe looked around at his men. His men! This was not the crew he had left port with. He met their eyes squarely.

"Not quite!" he answered Bronson. "But you should have seen the other fellow—"

THE END.





BRASS TACKS

On the next two pages, in semigraphical form, is the "Heinlein History"—Robert Heinlein's background suggestion of the history of the near future. Against this background, all the Heinlein science-fiction stories are laid. Heinlein's fantasies—"The Devil Makes The Law" and "They"—which appeared in *Unknown*, are not, of course, based on this background.

Reference to the Editor's Pages will help clarify some of the material. In addition, those story titles in parentheses represent material already planned either vaguely, or in detail, but not yet written, the stories still to be told. The stories already told have appeared in the following issues of *Astounding*. A brief explanation of what each story was, to jog your memory, is added.

Story	Issue	Subject
<i>Life-Line</i>	Aug., 1939	"Pinero" invented a length-of-life predicting machine.
"—And He Built A Crooked House"	Feb., 1941	Quintus Teal built a fourth-dimensional house.
<i>The Roads Must Roll!</i>	June, 1940	Strike of technicians maintaining the vital rolling roadways.
<i>Blowups Happen</i>	Sept., 1940	Danger—and madness—of operators of the first atomic power plants.
<i>Requiem</i>	Jan., 1940	D. D. Harriman, pioneer backer of interplanetary rockets, dies on the Moon.
<i>Logic of Empire</i>	Mar., 1941	Sam Houston Jones and Wingate get drunk—and enslaved on Venus.
<i>If This Goes On—</i>	Feb., Mar., 1940	The revolution that ends the religious dictatorship in U. S.
<i>Coventry</i>	July, 1940	Tale of the country where social misfits were exiled following the revolution.
<i>Misfit</i>	Nov., 1939	Libby, the mathematical prodigy, misfit in civilian life, makes good in the Cosmic Construction Corps.
<i>Universe</i>	May, 1941	See Page 9, this issue.

As this is written, Heinlein tells me he is working on "While The Evil Days Come Not." The title may never appear—as may be true of several of the other stories listed as "to be told." Sometimes in process of writing, a title that fits better becomes apparent. "While The Evil Days Come Not" is a case where that is probably going to happen; the working title is too long and clumsy to be fully effective.

So, if you never see a Heinlein story called "The Sound of His Wings," that won't prove you haven't seen the story referred to.

The Editor.

DATA	SOCIOLOGICAL	REMARKS
	Collapae of Europe THE "CRAZY YEARS"	Considerable technical advance during this period, accompanied by a gradual deterioration of mores, orientation, and social institutions, terminating in mass pay-choses in the sixth decade, and the Interregnum.
Transatlantic rocket flight Antipodes rocket service	Strike of '60 The "FALSE DAWN," 1960-70 First rocket to Moon, 1978 Space Precautionary Act Harriman's Lunar Corporations Luna City founded PERIOD OF IMPERIAL EXPLOITATION, 1970-2020 Revolution in Little America Interplanetary exploration and exploitation American-Australasian Anschluss	The Interregnum was followed by a period of reconstruction in which the Voorhis financial proposals gave a temporary economic stability and chance for re-orientation. This was ended by the opening of new frontiers and a return to nineteenth-century economy.
Bacteriophage The Travel Unit and the Fighting Unit Commercial stereoptica	Rise of religious fanaticism The "New Crusade" Rebellion and independence for Venusian colonists Religious dictatorship in U. S.	Three revolutions ended the short period of interplanetary imperialism; Antarctica, U. S., and Venus. Space travel ceased until 2072.
		Little research and only minor technical advances during this period. Extreme puritanism. Certain aspects of psychodynamica and psychometrica, mass psychology and social control developed by the priest class.
Boater guns Synthetic foods Weather control Wave mechanica The "Barrier"	THE FIRST HUMAN CIVILIZATION, 2075 et seq.	Re-establishment of civil liberty. Renaissance of scientific research. Resumption of space travel. Luna City refounded. Science of social relations, based on the negative basic statements of semantica. Rigor of Epistemology. The Covenant.
Atomic "tailoring," Elementa 93-416 Parastatic engineering		Beginning of the consolidation of the Solar System.
Rigor of colloida Symbiotic research Longevity		First attempt at interstellar exploration. Civil disorder, followed by the end of human adolescence and beginning of first mature culture.

The man has something there. Not straight Graeco—Roman, but on that order maybe—

Dear Sirs:

Am writing in as one of those "first-letter-to-the-editors" boys. I just wanted to tell you that I rather liked Bond's "Magic City." For me the theme has great possibilities.

But for the life of me I can't see why our social-science fictioners like Bond and Heinlein so often throw the world back to primitivism. Can't they imagine a non-machine culture without talking in terms of the hairy apes? What about Egypt, Syria, the Hellenic World, Crete and China? Couldn't a civilization emerge along the cultural lines of one of these? Why must we always have Rousseau's Noble Savage, with his biceps, his stone ax and his mate crawling around the ruins of mighty Nyawk or Chikgo? After all, don't you think a post Euro-American Age would at least start in on the level of say, Rome?

That is all I can pick off the bones of "Magic City." I would welcome controversy on above criticism. Anyway, I'm genuinely glad to see Astounding going in for social-science fiction. It's typical of the trend away from pure astronomy, physics and chemistry. For me a science of human behavior is the most fascinating kind of science.

Pat on the back for de Camp. His series on the "Whitherers" was super-swell. I'm really glad to see some one popularizing Toynbee's "Study." Have been following "Study" for a year now. I would really like to see that graph that Heinlein has of "Future History." I'm making mine and would like some help.—Richard Rafael, 20 Taraval Street, San Francisco, California.

"Crooked House" seems to have been popular.

Dear Mr. Campbell:

I have noticed that I always have trouble getting to sleep after the arrival of the current Astounding. I think this is because of the previous four or five hours spent in a furious cover-to-cover reading of said issue, after which I start mentally writing a ten-thousand-word edition of this letter. The best of the many beginnings thus mulled and remulled is in regard to "Trouble on Tantalus." I'm afraid the boys have finally done it; made so many pointed

remarks about your authors slanting their stories for you that you either cracked under the strain or else decided to l'arn 'em for good. To put it more bluntly, it was the juiciest mess of lurid scrapings from a hundred hack plots ever to appear since those medieval Claytons. The only ray of gladness gleaned from it was the hope of a fitting rejoinder from Carl Anderson as good as his current Brass Tacks. At least the illustration was no better than it deserved.

So, after some last tossing and muttering, I gravitate back to the cover and feel much better. So far Rogers has leavened his pictorial dough perfectly with such pleasing relapses from stark steel and leering lensmen. And so to "Magic City." Were it not for my personal limitations, I would have greatly enjoyed this story. However, when characters abuse my love of logic to such an extent, only their nonexistence saves them from a beating about the head and ears. This is almost the only story for which M. Isip has been suited. At least he can draw a pretty face, which is a beginning. Rate this a thousand miles above "T on T," but still below the rest of the issue.

Remember my theory? Well, anyhow, "Castaway" is another of those stories that would have been one of the very first in a perfectly regulated society. It depicts one of the smallest facets of the picture with the drama it deserves, and thus implies even "The Skylark." I suppose if Schneeman had illustrated it he would have produced a three-quarter rear view of Parker watching a similar Bobo fiddle with a magnificent batch of radio apparatus. Cartier would have produced one of his usual whimsical masterpieces—no, I haven't forgotten "Vault of the Beast." However, if baby can't have candy all the time, I can take Binder's version.

Well, I'm still awake, and just getting around to "—And He Built a Crooked House." Because of the same personal limitations which hindered my enjoyment of Bond's story, my reaction to this is a maniacal gurgle of glee. Possibly it's just a conditioned reflex caused by Schneeman's pint-sized cuts for "The Mechanical Mice" and a Rocklynne-engendered love of a problem, solved or not.

Getting a little drowsy, by now. I mean me. Sturgeon's tale just about split the middle on Astounding's good average on how to unmess the messed spacecan. Same feelings on Binder as before.

The article just about puts me to sleep, but only because it was a very good article, and I actually remember most of its weighty facts.

I wish I could use that scented movie idea in a scented letter, so that when you come to the remarks on "The Best-laid Scheme," a beautiful aroma of something beautifully aromatic would pervade the atmosphere for a moment. As for Cartier, I still say masterpiece. As for de Camp, it was a totally unnecessary little tale which we had no right to deserve and for which I humbly give thanks. Tie it with Heinlein's.

I'll skip "Sixth Column" until its completion because this letter is already too long, and if I remember rightly, I became very, very sleepy at about this point.—Dick Wortman, 842 East 97th Street, Seattle, Washington.

Rogers' covers are receiving a very unusual amount of praise.

Dear Mr. Campbell:

The fact that stories about revolutions have been overdone of late in Astounding would have made "Sixth Column" just another excellent yarn, had it not been for MacDonald's swell plot and treatment thereof. Thus I reverently place "S. C." in the No. 3 niche of Astounding's Hall of Fame, side by side with "If This Goes On." In case you're interested, No. 2 niche is occupied by "Final Blackout" and "The Gray Lensman," No. 1 by "Slan."

As for the other stories in the March issue—regarding "S. C." as a separate entity—I rate them as follows:

1. "Logic of Empire"—Heinlein
2. "Poker Face"—Sturgeon
3. "Masquerade"—Simak
4. "Blockade Runner"—Jameson
5. "Eccentric Orbit"—Thompson
6. "Putsch"—Philips and Roberts

Hope another Smith epic is coming up—perhaps about the Arisians?

Only by keeping my emotions under rigid ten-point steel control, can I accurately describe the cover as "a masterpiece." Otherwise I would go on raving for reams. Though each cover is better than the last, the improvement is smaller as perfection is neared—thus resembling a series. As for the interior illustrations—still the weakest point—M. Isip has done the best on "Putsch." Since you're experimenting with

different artists in an attempt to improve, why not try Finlay?

I, too, thought "General Swamp" was good.—Bill Stoy, 140-92 Burden Crescent, Jamaica, New York.

Jack London: Prophet.

Dear Mr. Campbell:

In the March Astounding we have a number of noteworthy happenings: 1. Another Heinlein taking first place; but that's not so darn remarkable. 2. "Sixth Column" winding up very satisfactorily and only taking third, in my ratings anyhow. 3. Astounding's generally high standards actually kept up all through one whole issue. To elucidate, here are my ratings:

1. "Logic of Empire"
2. "Poker Face"
3. "Sixth Column"
4. "Space Has a Spectrum"
5. "Putsch"
6. "Blockade Runner"
7. "Masquerade"
8. "Eccentric Orbit"

The above represents half an hour's work; that's how close all of them were. "Putsch," I put fifth, yet I'd say it was quite a bit better than "Salvage." Right away down to No. 8 every yarn was good.

Taking a long jump over to the Brass Tacks column: I wish you'd answer the letters. In the case of my own, which thanks for printing, the little note at the top was quite obvious and adequate; but some of the others seemed to invite answers. So, right now, I'm saying what I have to say on a couple of them.

Charles Johnson wrote a review of the year which was too long not to contain material for discussion. Very entertaining it was, but I fail to comprehend any guy not liking "Farewell to the Master," "Reincarnate," and "Butyl and the Breather." The objection cannot be lack of science, for later in the letter he cautions you to "remember the name is Astounding Science-Fiction." Personally, I think you should let really good stories in the magazine, science or no science; but a little good, plausible science in any story improves it a great deal, and that's not excluding the social sciences and psychology.

Which reminds me, that fellow who wrote from England said, among other things, that "Final Blackout" was not science-fic-

tion, but a "historical story of a military genius, set in the near future instead of the past." Science-fiction always used to be remotely related to prediction. The prediction in "Final Blackout" is not original, in fact is quite commonly used and is not in the natural sciences, but is still enough to bring the story under the s-f heading.

In your editorials you gloat, and rightly, over the various scientific advances science-fiction has foreseen. What would you say to a writer who in 1906 predicted the rise of Fascism? I'll tell you: you wouldn't say anything, because he's dead, and his name was Jack London. Jack London was a socialist, and he overestimated the strength of the socialist party; that was his one big mistake in this prediction. He said America would declare war on Germany in 1912. Pretty close, eh? But he thought the socialists would by then be powerful enough to prevent war, and this threw him off, so that he had Fascism rising in the U. S. and Britain instead of Italy and Germany. However, he called the turn on Japan.

Listen to this quotation: "The oligarchs"—his name for the Nazis—"themselves were going through a remarkable development. As a class, they disciplined themselves. There were no more idle-rich young men."

"Many have ascribed the strength of the Iron Heel"—Nazis—"to its system of reward and punishment. This is a mistake."

"Out of the ethical incoherency and inconsistency of capitalism, the oligarchs emerged with a new ethics, coherent and definite, sharp and severe as steel, the most absurd and unscientific and at the same time the most potent ever possessed by any tyrant class. The oligarchs believed their ethics, in spite of the fact that biology and evolution gave them the lie."

All this from "The Iron Heel," by Jack London, written in 1906, copyrighted in 1907, which you can get at any large public library or Communist bookshop. My point is this: isn't that kind of stuff, intelligent prediction of future events based on facts at hand, more science-fiction than Superman in bulgar suits galloping around on alien planets? Not that good stories can't be written in impossible settings, but it's these screwy ray guns, degavitizers, repulsor fields, et cetera, that make some of my friends smile their "let's-humor-him" smile when I tell them I read science-fiction. No bull, even the fair name of Astounding is being dragged to the dust by these comic-strip kind of stories. To get back to the

topic on hand, I am requesting more possible, logical stories of the near future, and less crazy opium dreams. Fantasies are frequently good, but they are frequently putrid, and I would like to caution you to remember the name of the magazine is *Astounding Science-Fiction*.—Chandler Davis, 309 Lake Avenue, Newton Highlands, Mass.

I disagree; any subject can make a powerful story. It's just that it takes immensely more ability to handle some types than others.

Dear Mr. Campbell:

Writing a letter is a matter of extreme difficulty for me, and while I usually compromise by not writing at all, I have been forced by an uneasy conscience to tell you that you are publishing, I think, some things that are good.

For some time I have read and kept each issue, always hoping for the real story to come along. Until recently, and with one exception, I was disappointed. There were many stories that were amusing or entertaining; only one, "Robot's Return," had that haunting beauty that is unforgettably good.

But that was in another "era." February, 1940, began the new era with the powerful logic of "If This Goes On," followed quickly by the too real "Final Blackout," and the masterful "Slam." These stories were a great change from those that had gone before; they were a different kind of story—but I was not surprised to see them in print. These were of the kind of story bound to appear, for any author not living in the ivory tower can see the menacing shadows across the world of today, and not a few will strive to see beyond.

These stories, I am certain, are but the first of many sociological prophecies—by the way better stories, because the authors will be working in a medium which will make real writing possible. Let me explain more precisely. To be truly powerful, a story must have a one-track mind; all must be subordinate to the central idea. Under these conditions, a story based upon a scientific theory "Men and the Mirror" or "Cold" cannot be strong with the intensity of good writing, for it is inherently faulty by the dividing of interest between the scientific phenomenon, the events which lead to the phenomenon, and the characters in the story.

There is another kind of story which may be good, and yet not be suitable to science-fiction, a character study in a future setting "Crucible of Power," or an adventure story in a future setting "Doom Ship"; in either case the future setting is not necessary or an integral part of the story, for the one, excellent for character as it is, with changes of detail could have fitted equally well in present or past time, while the other story might just as easily have been set on an ocean liner, and anyhow it's—"Doom Ship"—the same old story of the heartless crook collecting the insurance.

Too, there is the scientific melodrama, "Gray Lensman," which is usually interesting, refreshing, which makes good reading and is yet not good writing, for, as in any melodrama, realism is lacking. "Gray Lensman" is an epic, it is colossal. No one will deny the very intense enjoyment derived from that story, but did anyone feel the story, seem to live it? I doubt. It was a glorious adventure set against titanic forces, but it was utterly unreal, it was just too big.

There are other examples I will not take space to mention; they are easily found. There are other forms, such as de Camp's brilliant articles, which are excellent in themselves, but are of no consequence in the matter of a good, serious story suitable to science-fiction.

Finally, we come to a kind of story that allows good writing. The first inkling we got was from Asimov's "Trends," but that story was too short to make a splash, and we had to be hit again over the head with "If This Goes On," to become aware that the sociological story was going to make a place for itself; the seat was there, it just hadn't been occupied for some years. Here is why the sociological story allows of good writing: There is a continuity of story from start to finish, for in dealing with the idea of a social force we follow a chain of events that permits no deviation, starting with symptoms and causes, and working out with the help of the characters and their machines the events to the logical conclusions. It is much like a chronicling of future history, and we know that any bit of history is fascinating in itself. This kind of story has an inherent reality about it, dealing as in any great story with men and events, and tools which affect both.

And I suspect, too, that in addition to these advantages pointed out, the author's writing will improve with the widening of

his field and the challenge of a powerful story.

"If This Goes On" is not great writing, but it was a first bold step.

"Slan" is free and powerful, and has moments of writing which are very beautiful. It barely falls short.

"Final Blackout." The terse grimness, the realness of its characters, and its inevitable logic, fit this to stand alone. It is a story. I mean that it could be read and appreciated, and judged by literary standards, by anybody. Those who criticize the political implications of "Final Blackout" should remember that an author does not always put down what *he wanted* to happen, but what, in the story, *had* to happen. Life itself is not a happy condition, except in moments all the more beautiful for their rarity, and the continual happy ending becomes insipid through its very unreality.

I make "Final Blackout" an example because it is a taste of the great writing, that, in this limitless field of science-fiction and fantasy, is bound to come.—Stilson Wray.

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The Stolen Dormouse



By L. Sprague de Camp

The second and concluding part of a novel of a wacky, feuding future world.

Illustrated by Rogers

Young Horace Juniper-Hallett has a lot on his mind." It all started with a riot at the Radio Exposition in Los Angeles, the capital of the American Empire. This Em-

pire is a Corporate State—motto, "All that is not compulsory is forbidden"—which started out as a dictatorship and has evolved into a quasi-feudal state wherein

the dictators are powerless puppets, and control is exercised by a corrupt and turbulent aristocracy derived from the executives and directors of the great private corporations.

As a result of this riot, Horace was promoted by the head of his clan, Lord Archwin Taylor-Thing, chairman of the board of the Crosley Co., from the rank of white-collar to that of businessman—the equivalent of knighthood.

Horace's mortal enemy is Justin Lane-Walsh, heir to the vice-presidency of the rival Stromberg Co. After the riot, the Los Angeles police chief forced the chairmen of the rival companies to agree to degrade and expel any members of their respective companies who engage in duels during the exposition. Horace Juniper-Hallett contrived to steal his enemy's clothes—with the distinctive Stromberg colors—and crash the Stromberg ball. Here he met and fell in love with Janet Bickham-Coates, the daughter of the lord chairman of the rival company. One thing led to another, and within a few days Horace and Janet were secretly married by Miles Carey-West, an old geneticist.

Janet returned to the Stromberg Building, a skyscraper-fortress in Los Angeles, to break the news to her parents. Horace Juniper-Hallett was attacked in the street by Lane-Walsh, furious at the theft of his clothes. In the resulting duel, Juniper-Hallett fractured Lane-Walsh's skull with his dueling stick. The chairman of Crosley, as he had sworn to do, degraded and expelled Juniper-Hallett. But Lord Archwin secretly informed him that he might reinstate him if Juniper-Hallett uncovered the mystery of the stolen dormouse.

A dormouse is a person under the influence of the drug hibernine, which causes its user to pass into a coma which lasts for some hundreds of years. The bodies of those who became dormice before use of the drug was forbidden are kept in a pseudo-mausoleum called the "Sleepers' Crypt" in Griffith Park, and comprise one of the capital's main tourist attractions. One of these sleepers has disappeared. Each of the great companies suspects the others. Some suspect the mysterious Hawaiians, because the dormouse, Arnold Ryan, was part Hawaiian. Little is known of the Hawaiians, except that they lead an immorally lazy existence in islands protected by impenetrable fortifications.

Horace Juniper-Hallett gains entrance to the Stromberg Building and to his bride's

room. Because Janet's mother comes in, Juniper-Hallett is forced to spend an uncomfortable night under the bed with Dolores, Janet's pet puma. Dolores gives Horace hay fever. The following morning, after Lady Bickham-Smith leaves, Juniper-Hallett enters the air-conditioning system and travels down to the biology room in the basement. He discovers that the body of Arnold Ryan was in the room—the Strombergs had stolen it from the crypt—but that it has disappeared a second time, causing much excitement and dismay among the Stromberg engineers. These see Juniper-Hallett lurking in the air duct and pursue him. He knocks out the leading pursuer, one Duke-Holmquist, returns to Janet's room, and, exhausted by his climb up the air shaft, falls asleep at once.

V.

JUNIPER-HALLETT awoke after dark. He felt almost human again, and very hungry. The cause of his awakening was the click of the door as Janet returned to her room after dinner.

"Here, sweetheart," she said, producing a couple of hard rolls.

"Wonderful woman!" he replied, sinking his teeth.

She said: "Mother's going to spend the night here again. It's her nightmares."

"Then I'll have to get out somehow. Right away."

"Oh, must you, Horace?"

"Yep. I don't fancy another night with Dolores."

The puma, hearing her name, came over to Juniper-Hallett and rubbed her head against his knee.

"She likes you," said Janet.

"That may be. But she gives me hay fever, and she has too much claws and teeth for my idea of a pet. How'll I get out, old girl?"

Janet got a raincoat, a hat, and a pair of shoes out of a closet. "If you put these on—"

"What? Good Service, no! If it ever got out that I'd been doing a

female impersonation, I'd never live it down. The mere idea gives me the horrors."

"But that's the only thing I can think of—"

"Me run around in a girl's clothes? Yecow!" He closed his eyes and shuddered. "If they caught me in what I'm wearing, the worst they could do would be to beat me to death. But that—*br-r-r-r!* No, a thousand times no!"

Half an hour later he had his pants legs rolled up under the raincoat, and was putting on the hat. His expression was that of a man about to have a boil lanced by a drunken friend with a rusty jackknife.

He stood up. Dolores rubbed against his legs; then suddenly reared up, embraced him with her muscular forelegs, and threw him. She sat down on him and licked his chin. She had a tongue like sandpaper of the coarsest grade.

"Hey!" said Juniper-Hallett.

"She wants you to stay and play with her," said Janet. "She loves to wrestle."

"But I don't," said Juniper-Hallett.

Dolores was persuaded to let Juniper-Hallett up, and was sent out for a walk with Janet's maid while Juniper-Hallett hid.

When Horace Juniper-Hallett got home late that night, he took off the hat and the shoes and flung them on the floor with a violence all out of proportion to the crime, if any, of these inoffensive garments.

JUNIPER-HALLETT'S next obvious step was to report to Lord Archwin of Crosley that he had arrived at the Stromberg laboratories just as the Strombergs learned that somebody else had made off with the precious dormouse.

He didn't relish the prospect.

Lord Archwin might have regretted already sending an untrained young sprig out to gumshoe and be glad of an excuse to call the deal off and put a professional Sherlock on the job. So Juniper-Hallett was relieved next morning when he learned at the Crosley building that Archwin Taylor-Thing was down at the Exposition, which was closing that day.

Juniper-Hallett was starting out of the receptionist's vestibule when he noticed a man sitting with a brief case—not a businessman's fancy leather one, but a plain rubberoid bag—in his lap. The man had a large quantity of curly black hair, tinted spectacles, and beard. Juniper-Hallett did not know any men with beards, but still this one did not look unfamiliar to him.

"Waiting to see the Old Man, sir?" he asked pleasantly.

"Da. Yes."

"He won't be back until late this afternoon, sir."

"Saw? That is too bad. But I shall wait for him anyway."

"I'm going down to see him now. Can I take a message?"

"Da. Tell him that Professor Ivan Ivanovitch Chelyushkin waits to see him. He has wery important invention to shaw him."

"How long have you worn those whiskers?" asked Juniper-Hallett.

"Years and years. Gaw, young man, and geev your master my message!" The professor rose and pointed imperiously to the door.

"I think," said Juniper-Hallett in a low voice, "that you're the lousiest actor I ever saw, Justin old slug."

The eyes behind the tinted glasses took on an alarmed, hunted look. "You damn dirty Crosley," whispered the bearded man fiercely. "If you say a word, I'll break your neck before they can—"

Juniper-Hallett laughed at him.

"Now, now, I don't want Your Loyalty beaten to a jelly. That's what they'd do; beat you to a jelly." He repeated the word "jelly" with relish. "I'm not technically a Crosley any more, you know."

"That's right, so you aren't. And I'm nobody's Loyalty. But—"

"Let us gaw outside, my frand, where we can talk wizzout vulgar interruptions," said Juniper-Hallett.

JUSTIN LANE-WALSH explained, crestfallen: "After I got out of the hospital, they degraded and expelled me, just as they said they would. But our Old Man told me not to go off the deep end, because he might have some confidential work for me.

"So last night I get a call from him, and he tells me somebody's got our dormouse, the one we expropriated from the Crypt. You know all about that, don't you? So the Old Man says, you find where the dormouse has gone, and we'll see about giving you your rank back."

"Same thing happened to me, exactly," said Juniper-Hallett. He explained why he was sure the Crosleys had not stolen the dormouse. Lane-Walsh scratched his head, getting black hair dye on his fingertips, but he could not see a hole in Juniper-Hallett's reasoning.

Juniper-Hallett went on: "Matter of fact I had an idea, when I saw you, that we'd do better together than working against one another. Why not? We're both outcasts."

"Well," said Lane-Walsh hesitantly, "suppose we find the dormouse; which of us—or which of our two companies—gets him?"

"We could fight it out," said Juniper-Hallett. He was sure he could handle Lane-Walsh, despite the latter's size.

"Can't. The doc told me I couldn't fight any more duels for a year, on account of what you did to my skull last time. Are there any other honorable methods?"

"We'll have to flip a coin or something." Juniper-Hallett dismissed the disposal of the dormouse with an airy wave. Lane-Walsh, still doubtful, gave in.

Juniper-Hallett said: "I don't guess there's much point in prowling around our own companies' buildings any more. What we want is a lead to the Hawaiians or the Ayesmies."

"Do you know any Hawaiians?"

"No. Do you?" asked Juniper-Hallett.

"I've never even seen one. I understand they have brown skins and flat faces, sort of like Mongolians."

"Well, if we don't know any Hawaiians, how are we going to find their secret headquarters? If they've got a secret headquarters."

Lane-Walsh shrugged. "I suppose we'll have to go after the Ayesmies then. But I don't know any Ayesmies, either."

We both know some engineers, though. And any engineer might be an Ayesmy."

Lane-Walsh opened his eyes as if this was a great revelation. "That's so! There's one engineer around our building I don't like. He ought to be an Ayesmy."

So EVENING found the amateur Sherlocks lurking in the shrubbery—literally—in front of the Stromberg building.

"That's him," said Justin Lane-Walsh. A portly man had just come out of the front entrance. "He walks home every night at this time."

They rose and followed the engineer Lane-Walsh didn't like.

They followed him to the restaurant where he ate his dinner. Lane-Walsh whispered to Juniper-Hallett: "That's one of the things that made me suspect him. What's his idea of sneaking off to eat by himself? They serve good grub in the Engineers' Mess in our building."

Juniper-Hallett replied: "Let's order something; but not too much. We don't want to be in the middle of our meal when he finishes."

Juniper-Hallett had a tuna-fish sandwich and a glass of wine. Lane-Walsh had a glass of milk. The milk got in his beard, which was held on with a water-soluble adhesive. He had to hold the object in place with one hand. He muttered: "What's this about your getting married to the Old Man's daughter?"

Juniper-Hallett told him.

"I'll be damned," said Lane-Walsh. "That's another reason for knocking your head off, when we have our duel after I get well. Janet's a good kid, though. If I were sap enough to marry anybody, she'd do very nicely. Reminds me of a Spanish girl I met at a party last week. She was shaped like *this* and like *this*." He gestured. "And when I woke up—"

Just then the stout engineer whom Lane-Walsh didn't like got up. His pursuers got up, too, and followed him out.

As they mounted the stairs to the sidewalk, the engineer was there waiting for them. He came right to the point. "What the devil are you two following me for?"

"We aren't," said Juniper-Hallett.

"We were just waiting for an airplane, sir," said Lane-Walsh.

"Bunk!" roared the engineer Lane-Walsh didn't like. "Get out of here. Right now, or I'll call a cop!"

They went.

VI.

SLEEPER'S CRYPT, colloquially known as Dormouse Crypt, occupied the southern corner of Griffith Park, at Western and Los Feliz. From this elevation the Crypt commanded a fine view of the capital city, which its permanent residents were in no condition to appreciate. The Crypt itself was a big mausoleumlike building, streamlined. "Streamlined," in the language of the time, meant, not shaped so as to pass through a fluid with the least resistance, but covered with useless ornamentation. The word got this meaning as a result of its misuse by twentieth-century manufacturers, who took to calling boilers, refrigerators, and other normally stationary objects "streamlined" when they merely meant that they had dressed their products up in sheet-metal housings and bright paint. Hence "streamlined" came to mean dressed up or ornamented, with no reference to aerodynamics.

At the entrance to the Crypt was a cluster of watchmen. At sixteen o'clock, the line of sightseers entering the Crypt contained Justin Lane-Walsh and Horace Juniper-Hallett, conspicuous in their sober proletarian off-hour costume among the gaudy colors of the great companies.

As they entered, Lane-Walsh remarked: "They've got about twice as many watchmen as usual here today."

"I guess they're not taking any more chances of having another dormouse stolen," said Juniper-Hallett. Just then they passed through a turnstile; one of a pair, one for incomers and the other for outgoers.

Like all visitors to the Crypt, they lowered their voices. It was that kind of place. There was hall

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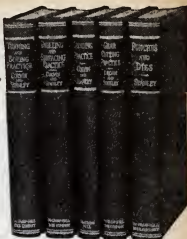
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The coffin slid aside, and a moment later he started down the stairs revealed.

after hall, each with its rows of glass-topped caskets. In each casket was a sleeper. There was a little light above the head of the sleeper, which a visitor could flash on by a button if he wished to examine the sleeper's face. At the foot of the casket was a

plate with the sleeper's name and other pertinent information, including the estimated date of his awakening.

Lane-Walsh switched on one of these lights. The sleeper was a girl. "Some babe," said Lane-Walsh.

"If she was ready to wake up, now—"

"Wouldn't do you much good," said Juniper-Hallett, reading the plate. "She isn't due to wake for fifty years. And you won't be up to much then."

"Sall right, I'll be up to more at seventy-five than you are right now, shrimp. Say, I always wondered if they called 'em dormice because the top of the coffin comes up like a door when they wake up and pull the switch."

"Nope. Matter of fact they're named after some kind of mouse they have in Europe. It goes into a very deep sleep when it hibernates. Oh-oh, here's a new one. I didn't know they were still taking them in."

"Sure," said Lane-Walsh with much worldly wisdom. "You can get hibernine easy if you got the right connections."

Another of Juniper-Hallett's youthful illusions popped. He concealed his feeling of shock, and led the way to the hall that had contained the torpid body of Arnold Ryan. There was quite a crowd around the empty Ryan casket. When Juniper-Hallett and Lane-Walsh wormed their way in close, they bent over and examined the object eagerly. This was what they had come for: having run out of all other ideas, they thought there might possibly be a clue in or around the Ryan casket.

But the casket was exactly the same as all the others in the Crypt, except that the padding and the electrical connections had been removed from the interior. There remained nothing but a big plastic box, without even a scratch to hint at the destination of the victim.

DISAPPOINTED, they strolled off, snapping casket lights on at random.

Juniper-Hallett said: "All these folks, I understand, took a hibernine pill because they hoped they'd wake up in a better world than the one they were in. I wonder how many of 'em will really like it better."

Lane-Walsh laughed harshly. "Whaddya mean, better? We've got a properly organized set-up, haven't we, with a place for everybody and everybody in his place? What more could they want?"

"I was just wondering—"

"That's the trouble with you, shrimp. You'd almost be a man if you weren't always wondering and thinking. Hell, what does anybody want to think for? We hire the engineers to do that. Hey, what—"

Juniper-Hallett was bending over behind one of the caskets. He said softly: "They ought to polish this floor up better." He waved Lane-Walsh to silence as the latter opened his mouth to speak. Lane-Walsh, for all his bluster, took orders docilely enough in the presence of anything he did not understand.

"See," said Juniper-Hallett. There were a lot of parallel scratches running from the casket to the wall. "Somebody's been shoving this box back and forth. Now if we could stick around here after the guards chase the rest out at seventeen—Oh-oh!"

"What's up, sister?" asked Lane-Walsh.

"You wouldn't understand, lame brain. It occurs to me that there's a comptometer hitched to each of those turnstiles, so the guards can tell after they close the place whether as many people came out as went in. Got it?"

"Oh. I get it. What'll we do then?"

"If you'll shut up and let a man with a brain think, maybe I can fig-

ure a way." Juniper-Hallett fell silent. Then he gave his friendly enemy instructions.

They started out the front door, Lane-Walsh leading. Lane-Walsh passed through the outgoing turnstile and halted a couple of steps beyond it to light a cigarette. He remarked to the nearest guard: "So this is your wonderful Los Angeles climate, huh? I've been here just a week, and it's rained the whole time."

The guard grinned. "You oughta be here in summer, mister. Say, would you move out of the way a little? People want to get by you."

"People" in this case meant Horace Juniper-Hallett. He had gone through the turnstile behind Lane-Walsh. When Lane-Walsh had stopped, he had stopped, too. While concealed from the doormen by Lane-Walsh's broad shoulders, he reached back and gave the turnstile a couple of quick yanks.

They strolled off into the drizzle while Lane-Walsh finished his cigarette. Juniper-Hallett explained: "I turned the out turnstile a couple of extra quadrants, so it reads two visitors too many."

"So what? If the out stile reads two more than the in, they'll know something's wrong—"

"Dimwit! When we go back in we'll raise the reading on the in stile by two, so they'll balance after everybody but us has been cleared out."

"Oh," said Lane-Walsh. "I get it. We better hurry back, or they'll wonder why we're coming in just before closing time."

"Almost human intelligence," said Juniper-Hallett. "It'll be too bad to spoil what little wits you have by cracking your skull again, when we have our duel."

AT SEVENTEEN the guards blew their whistles and herded everybody out. Juniper-Hallett and Lane-Walsh, by a bit of adroit dodging, hid from the guards, and were left in the empty Crypt. Most of the lights went out. There was no sound but the occasional, very faint, honk of an automobile horn wafted in from outside.

Juniper-Hallett took out a sandwich and divided it with Lane-Walsh, who had not thought to bring one. Between bites Juniper-Hallett pointed to a bit of incomplete electrical wiring along the wall. He whispered: "I guess they're putting in a fancy burglar-alarm system. Good thing we got here before they finished it."

"Say," said Lane-Walsh, "wouldn't it be something if all the dormice woke up at once and came out of their coffins?"

"It would scare me silly," said Juniper-Hallett.

"Me, too," said Lane-Walsh.

They fell silent for a long time, huddling behind a pair of caskets and listening to their own breathing. Even the breathing stopped when a night watchman passed through the hall on his rounds, his keys jingling faintly.

An hour later, when the watchman was due to pass again, Juniper-Hallett took off his shoes. When the watchman passed, Juniper-Hallett followed him, flitting from casket to casket like an apprehensive ghost.

He came back in a few minutes. He explained: "I wanted to find what route he takes. The last station he keys into is in the next hall; after he works the dingus there he goes down to the basement and smokes his pipe."

"So what?" whispered Lane-Walsh. "If you make me sit on

this floor all night just to watch the watchman make his rounds, I'll—"

"You suggested looking into this place!"

"Sure I did, but staying here all night was your—"

"Sh!"

TWO MORE hours passed, marked by the watchman's plod past.

Then the watchers heard another step; a quicker one. They did not have to see the man to know that he was not the watchman. He walked straight down the passage between the rows of caskets, and stopped at the casket that Juniper-Hallett thought had been moved.

The two outcasts peeked around the corners of their respective caskets. The stranger was pressing the button that lit up the inside of the casket, making a series of short and

long flashes. When he had finished, the casket rumbled back toward the wall, exposing a hole in the floor. Light illuminated the stranger's face from below, giving him a satanic look. He climbed down into the hole, and the casket slid back into place.

Juniper-Hallett whispered: "That was Hogarth-Weems, one of the Arsiay engineers!"

"Does that mean the Arsiays are back of all this?"

"Don't know yet."

They started to crawl toward the movable casket; then snapped back into their original positions as more footsteps approached. Another man walked in, flashed the light as the first one had done, and descended out of sight. Then came another, and another. Lane-Walsh recognized this one as a Stromberg

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engineer; so was the next one. Then followed a couple that neither knew; then a Crosley engineer.

Juniper-Hallett speculated: "It must be an Ayesmy meeting."

"Because they have engineers from all the different companies?"

"Right."

"Boy!" breathed Lane-Walsh. "What wouldn't Bickham-Smith give to know where their hide-out is! He hates 'em like poison, and so do I. Even worse than the Crosleys."

"What's so terrible about them?" asked Juniper-Hallett, more to be contrary than because he wished to defend the secret brotherhood.

"They don't know their place, that's what. They've got a lot of wild revolutionary ideas about abolishing compulsory technician's contracts, and letting engineers decide for themselves which company they'd like to work for. If their ideas were put through, it would gum up the whole machinery of our Corporate State. They—"

"Sh!"

They waited a while longer, but no more men came in. Eleven had entered the hole in the floor. Juniper-Hallett and Lane-Walsh crawled over to the movable casket. They put their heads down next to the floor and next to various parts of the casket. From one place it was possible to hear a faint murmur of voices, but no words could be distinguished.

Juniper-Hallett said: "The watchmen must be in on it."

Lane-Walsh nodded. They went back to their hiding places and waited for something to happen.

It did, in the form of another visit by the night watchman. Juniper-Hallett rose and followed him in stocking feet, beckoning to Lane-Walsh.

The watchman had just turned the key in the last signal station on

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his route, when Lane-Walsh's big hands shut off his windpipe. He struggled and tried to yell, but nothing came out but a faint gurgle. Presently he was unconscious. Lane-Walsh relieved him of his pistol.

Juniper-Hallett looked doubtful at this. "You know what the law and the Convention say about carrying a firearm," he said.

Lane-Walsh sneered silently. "Bunk! A lot of the upper execs and entrepreneurs carry 'em. I know."

Juniper-Hallett subsided, and helped to tie up and gag the watchman. For anybody other than an authorized person, such as a watchman or soldier, to have a firearm in his possession was a serious violation of the statutes, and was an even worse violation of the Convention than hitting an engineer over the head with a wrecking bar. Young company members were allowed to settle their differences with dueling sticks instead, whose use seldom resulted in fatal injuries.

Juniper-Hallett admitted that Lane-Walsh probably knew what he was talking about. On the other hand it irritated him that the man should be so violently in favor of the legal and social scheme under which he lived, and at the same time be so cynically tolerant of violations of its laws and mores, at least by members of his own group. Juniper-Hallett was one of those serious-minded persons who can never understand wide discrepancies between theory and practice in human affairs.

THEY WENT BACK to the hall containing the movable casket. Lane-Walsh wanted to flash the light in the movable casket and, when the casket moved, to jump down and

hold up the whole meeting. Juniper-Hallett refused.

They waited three hours more. Then the casket rumbled back. The eleven men climbed out one by one, five minutes apart, and disappeared.

"Now," said Juniper-Hallett.

"But, you damn fool, they're all gone! There won't be anybody in the hole!"

"Somebody let the first bird in," said Juniper-Hallett. "And unless he's gone out another exit he's there yet." He put his shoes on, went over to the movable casket, and pressed the light switch in the sequence of flashes used by the engineers.

The casket rumbled back. Light flooded up out of the hole.

Lane-Walsh, pistol ready, tumbled down the steep steps. Juniper-Hallett followed.

They were in a room, four or five meters square, with a door leading into another room. Two men were in the room. One was emptying ashtrays into a wastebasket. The other was gathering up empty coffee cups.

They stared at the intruders and at the intruders' gun. They slowly raised their hands.

One of them was the square man with the monocle, Duke-Holmquist. A patch of his scalp was shaven and covered with adhesive tape, where the wrecking bar had landed. The other man Juniper-Hallett did not know; he was a dark-skinned man with stiff gray hair and a smooth-contoured, slightly Mongoloid face.

"That's him. The dormouse," said Lane-Walsh, referring evidently to the dark man.

"Arnold Ryan to you, mister," said the dark man. "I'm tired of having people talk as if I were a rodent."

"All right, Arnold Ryan," said

Lane-Walsh, "what's this all about? What are you doing here?"

"Looking for four-leafed clovers, sir," said Arnold Ryan.

"Come on, come on, no funny stuff. You see this gun?"

"I say, is that a gun? I thought it was a grand piano."

Lane-Walsh got red in the face. "When I ask you something I want an answer!" he roared.

"You got one. Two, to be exact."

Lane-Walsh showed signs of imminent apoplexy. "I want to know what this meeting was! Ayesmies or what?"

"The meeting," said Ryan imperturbably, "was of the Los Angeles Three-dimensional Chess Club."

Lane-Walsh tore at his coppery hair with his free hand. "Liar! If it were a chess club, you'd have boards and pieces!"

"That's simple. We play it in our heads."

Juniper-Hallett touched Lane-Walsh's arm. "Better let me talk to him," he said. He asked a few questions of the two men, but got no more satisfaction than had Lane-Walsh.

They held a whispered consultation. "What'll we do with 'em?" said Lane-Walsh. "If we start a public row, we'll expose the Ayesmy, but they'll take the dormouse away from us."

Juniper-Hallett thought. "I think I know a place where we can hide 'em for a few days." He addressed Duke-Holmquist: "Mr. Duke-Holmquist, I don't know why you went to so much trouble to steal Mr. Ryan. But it's obvious that you wanted him pretty badly. So I won't threaten you; I'll just say that unless you come along peacefully, we'll shoot Mr. Ryan. We'll *try* not to shoot him fatally. All right,

Justin old fathead, make 'em follow me."

He led the way out of the secret room. Behind him he could hear a whispered argument between the two engineers: "I told you we ought to have changed the meeting place." "But we couldn't on such short notice; you know why." "Bunk! Once a dormouse was involved, somebody was bound to stumble on us sooner or later—"

VII.

MILES CAREY-WEST, Juniper-Hallett's elderly geneticist friend, was astonished to find four men ringing his doorbell at half-past one.

When the prisoners had filed in, Juniper-Hallett took Carey-West aside and explained the situation.

"Horace!" protested Carey-West. "I can't— That's a terrible thing to do to me! Where would I keep them? What if it were found out—"

"You could blame it all on us," said Juniper-Hallett. "And we'll keep them in your basement. Please! Maybe I can use them to stop the Stromberg-Crosley feud. And Janet—"

"Oh, very well," grumbled the geneticist. "No arguing with you, I see."

Duke-Holmquist and the dormouse were taken down to the basement and made more or less comfortable.

"What'll we do now?" asked Lane-Walsh. "Flip a coin to see who gets 'em?"

"I've got a better idea than that," said Juniper-Hallett. He explained his plan for using the dormouse as bait to persuade the heads of the Stromberg and Crosley companies to bury their feud and merge.

"What!" cried Lane-Walsh. "Us

join up with a lot of lousy Crosleys? The worst manufacturing company in the business?"

"Yep. You'll find we're not so bad."

"Oh, I see why you want it—so they'll let you and Janet live together peacefully. Though why some people are so hot about married life I never could see."

"That does enter in."

"Huh! As if it weren't bad enough that a good Stromberg gal goes and marries a weak sister like you, you want to ruin the proudest and noblest house of 'em all by—"

"Wait a minute, wait a minute, Justin old louse. Think of all the credit we'll get for stopping the feud and bringing about the merger! Everybody's forgotten what started it in the first place, and I'm sure the

execs would be glad to call it off if they could do so without losing face."

"Hm-m-m. Well. Now that you put it that way—but I'd have to think about it."

"That's easy enough. We'll have to get some sleep before we can start our campaign."

They agreed that Lane-Walsh should take the first watch. Juniper-Hallett, as he curled up, gave his partner a fleeting glance. In his mind were the first seeds of suspicion. If he were asleep, and Lane-Walsh had the gun, and Lane-Walsh decided to double-cross him and turn Ryan over to his company forthwith—

But so far Lane-Walsh had played the game fairly enough, even though he and Juniper-Hallett liked each other no better than when they

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started. A double cross like that, so easy, would be a violation of the code. And Horace Juniper-Hallett still had a good deal of faith in his code. What would be would be. He went to sleep.

LANE-WALSH awakened him at three, gave him the gun, and went to sleep in his turn.

Across the dimly lit basement the prisoners sprawled on their mattress. Duke-Holmquist was asleep, but Arnold Ryan was looking at him silently with bright black eyes.

"I wish you birds would tell me something about your activities," said Juniper-Hallett.

"I," said Ryan, "am a biological engineer, as you ought to know. I'm working on the development of a variety of pepper tree that doesn't shed little sticky red berries all over the sidewalk, to stick to the soles of your shoes. Those little berries are one of the major drawbacks to life in your charming capital, as I see it."

"No, seriously," said Juniper-Hallett, feeling very young and inadequate in the presence of this smooth jokester. "If I knew what you were up to, I'd have a better idea of whether I was doing the right thing. For instance, you're part Hawaiian, aren't you?"

"Everybody knows that," said Ryan. "My mother's name was Victoria Liliuokalani Hashimoto, which is as good an old Hawaiian name as you'll find. Each of the names carries the flavor of one of the three main ethnic strains we're descended from."

"Are you working for the Hawaiians?"

Ryan laughed. "You wouldn't expect me to admit it if I were?" he asked.

"All right. Can you tell me something about Hawaii? As far as I know, no American has been there for many years."

Ryan shrugged. "I can tell you

what I knew from first-hand experience before I went into the hibernine sleep; or I can tell you what I've heard in the few days since my awakening. Not, you understand, that I've been in personal touch with Hawaiians."

"Mainly I'd like to know why they don't let themselves be civilized like other people, and won't let anybody on their islands."

"Oh, that," said Ryan. "You think they should organize themselves into a tightly compartmented Corporate State like the American Empire, with an arrogant and disorderly aristocracy at the head of it, and worship Service at the Gyrotory and Tigers' Clubs every Sunday, and spend half their time running their legs off to produce as much as possible, and the other half running their legs off trying to consume what they have produced?"

"Well—I didn't say they should; I asked why they didn't."

"They don't like the idea, that's all. They'd rather just lie on the beach. They've got a stationary population, all the food they can eat, and all the houses they can live in. And in that climate nobody wears much of anything anyway. They do a good deal of scientific research, partly for fun and partly to devise new ways of keeping out people they don't want. But production—phooey!"

"They sound like a lazy lot."

"They are. And they value the right to be lazy so much that they've wiped out three fleets sent out from the American and Mongolian empires to change their way of living."

JUNIPER-HALLETT'S conscience bothered him a little for getting all this information while his partner was asleep. But, he thought, he could tell him the important parts

later. He asked: "Are they hooked up with the Ayesmy somehow?"

Ryan grinned. "Sorry, my boy, but you ought to know that topic is *kapu*."

"Well, what *do* they want? They're up to something, I'm sure."

"I am told," said Ryan carefully, "that they're tired of living in a perpetual state of seige. They'd like to travel and see the world now and then. So, I suppose, they'd be glad to back any change in conditions in the empires that would enable them to do so."

"How did they manage to defeat those fleets?"

"As I understand it, by three means: one, a new source of power—neither coal, nor petroleum, nor atomic power. Don't ask me what it is, because I wouldn't tell you even if I knew. You'll hear more about it when the Antarctic coal fields run out. Two: a system of multiplying terrestrial magnetism over a given area, so that any fast-moving metal object, like an airplane engine, gets red-hot from eddy currents when it passes through the field. And finally their aerial torpedoes, which are nothing very remarkable except for their system of remote control. Now you know almost as much about their defenses as the defense chief of the Empire."

"What's the Ayesmy?"

"The American Society of Mechanical Engineers."

"I know that," said Juniper-Hallett. "But *who* are they and what are they trying to do?"

"You're the most persistent young fellow. But I'm not telling you anything that the heads of your companies don't know already. When the professional societies were suppressed as a disrupting influence by the first dictator, who came to power following the short-lived Communist

regime that ruled after we lost the War of 1968—as I was saying, the A.S.M.E. was the only one that survived; underground, of course. And when the dictatorship began to decay under the fourth and fifth dictators, with the actual power being taken by a Board of Control representing the companies, they revived, though the companies fought them almost as hard as the dictators had done.

"Nowadays, as I understand it, the Ayesmy consists of a lot of engineers who don't like the Corporate State generally and the compulsory contract system in particular. They claim it makes them just high-priced slaves."

Juniper-Hallett was silent for a

few seconds while he tried to figure out how the term "high-priced slave" applied to the engineers, and, if it did, what was so objectionable about that status. He asked: "What do you think about the compulsory contract system?"

"I don't. I never have opinions on political questions." Ryan gave a slight, malicious grin that told Juniper-Hallett he wasn't to take these statements too seriously.

"Look here, what would you like us to do with you?"

"Let us go, and forget you'd ever seen us or the room under the Crypt."

"Why?"

"We'd just prefer it, that's all."

"We can't very well do that," said



Juniper-Hallett. "Our reinstatement depends on giving you up."

"I was afraid that was the case. But you asked me what we'd like."

"Is there any particular reason why we should let you go?"

Ryan shrugged. "Just say we're allergic to having the affairs of the Los Angeles Three-dimensional Chess Club poked into."

"Oh, now, you don't expect me to believe—"

"I don't care what you believe, young man."

Juniper-Hallett, feeling a bit hurt, shut up. This man fascinated him; Juniper-Hallett was sure he had the solution of all the little mysteries and discrepancies that had been puzzling him. But the man was not, he thought, inclined to meet him halfway.

"You understand," Juniper-Hallett told Lane-Walsh when they had breakfasted, "you're to telephone first to Lord Archwin, and then to Lord Billiam. You tell each one you'll hand the dormouse over to the other unless they'll listen to our proposals. When you've softened 'em up, arrange a three-way connection so you can talk terms. And—if you get a chance to send Janet here without letting the other Strombergs know where our hide-out is, I wish you would. This being just married and not even being able to see your wife is driving me nuts. Got it?"

"I get it, shrimp."

Juniper-Hallett hesitated. "I . . . I don't want you to think I'm suspicious, Justin old scum, but will you give me your word as a businessman?"

"Sure. You've got it."

Juniper-Hallett gave a sigh of relief. The word of a businessman was a pretty serious thing. He took the

pistol from Lane-Walsh, and watched his partner tramp up the basement steps and out.

Duke-Holmquist turned his monocle on Juniper-Hallett. "You're a pretty trusting young man," he said.

Juniper-Hallett shrugged. "He gave me his word. And if he ever wants to be reinstated, he won't dare break it."

Arnold Ryan grinned sardonically. "You have a lot to learn," he said.

They were all silent. Juniper-Hallett paced the floor nervously, keeping an eye on his captives. These did not seem much disturbed. Ryan was chewing gum and Duke-Holmquist smoking a malodorous pipe.

"Tell me," said Juniper-Hallett to Ryan, "how did they wake you up?"

Ryan shrugged. "Strontium bromide; an otherwise more or less useless salt. Some bright Stromberg engineer discovered that it counteracted hibernine. They kidnaped me from the Crypt so they could wake me up and ask foolish questions about the Hawaiians' power, without having to release the formula to the Board of Control and bid against the other companies for my custody. If any one company got the secret of the Hawaiians' power, it could practically extort control of the Board when the coal shortage arrives."

Juniper-Hallett continued pacing. For the first hour he was not much concerned. But as the second wore on, he felt more and more queasy. Lane-Walsh, in accordance with his instructions, should have finished his telephoning and reported back by now. Of course, the fact that he was to make his different calls from different drugstores, in case one of the chairmen should try to locate him, would complicate matters.

Juniper-Hallett couldn't leave his prisoners to do some telephoning of his own.

Time passed, and suspicion and alarm grew in Juniper-Hallett's young brain. Lane-Walsh might have met with foul play, or he might be indulging in a little of the same himself—

And he was tied to his prisoners. He didn't dare use his host's phone for fear of being located. He could not walk the captives around the streets in broad daylight at the point of a gun. He regarded the weapon with distaste; he had never fired one, and had been brought up to consider the possession of one by a white-collar or businessman a disgraceful thing.

He heard old Carey-West's doorbell ring. He listened, tensely, for Lane-Walsh's return.

But it was Janet.

"Darling!" they both cried at once. In the midst of the embrace that followed, Juniper-Hallett had the presence of mind to swing his beloved around so that her back was to the captives, whom he still menaced with the gun.

"Here," said Juniper-Hallett, pressing the gun into her hand. "Cover these men; don't let them get away until I get back."

"But Horace—"

"Can't explain now. Going out to phone. I'll be back shortly." And he bounded up the steps. Good old Justin—the louse had stuck to his word after all.

OUTSIDE the drizzle had ceased. Pools of water lay on the sidewalk, reflecting the cold blue of the sky. Juniper-Hallett shivered and stuck his hands deep in his pockets. He wished he had his overcoat along.

The nearest drugstore was The

Sun at the corner of Wilshire. Juniper-Hallett found his way through the hardware and furniture departments to the phone booths, tucked in one corner of the sporting-goods department.

He called Archwin of Crosley. As Lord Archwin was ex officio of the rank of entrepreneur, he could be located at any time through his private portable radiotelephone set.

"Horace!" cried Lord Archwin. "Where are you, my boy? I've been worried about you. Very much worried."

"I'm all right, Your Integrity," said Juniper-Hallett. "And I've got the dormouse."

"You have? You have? Where? We'll come collect him, at once!"

"Just a minute, Your Integrity. You see, I didn't catch him all by myself." He gave a thumbnail account of his co-operation with Justin Lane-Walsh, and of his offer to give up the dormouse in return for the chairman's promise to initiate a merger.

Archwin of Crosley heard him through, then asked suspiciously: "Where's that Lane-Walsh? Is he with you?"

"No, sir, he went out to phone you and his own chairman, leaving me with the prisoners. But I haven't heard from him, and I'm afraid something happened to—"

"You idiot!" yelled Archwin into his transmitter. "Idiot! Idiot! Imbecile! Fool! Don't you know he's gone to get the Strombergs to take your men away from you? Don't you know that?"

"But he gave me his word as a businessman—"

"Idiot! What's a businessman's word worth? Nothing, when his company's interests are involved! Nothing! What's any Stromberg's

word worth? Nothing, again! You tell us where to find the dormouse, quick, before the Strombergs get there, or—"

"Hey!" said Juniper-Hallett. "I won't do anything of the kind. And Justin Lane-Walsh did keep his word, at least as far as sending my wife to me. I've kept my word and he's—"

"You utter nitwit!" shrieked the chairman. "You young jackass! You can kiss your reinstatement good-by! We don't want traitors and sentimental pantywaists in the organization! You—"

Juniper-Hallett had heard Lord Archwin in a tantrum before, and knew that arguments were useless. He hung up and started sadly back to the geneticist's house. If the chairman said he wouldn't readmit him to the company, he wouldn't readmit him to the company. He wondered whether Lane-Walsh had gotten in touch with his own chairman—

And then an ominous thought struck him. He walked faster.

Janet was still there in the basement, covering the two engineers, who were being gallant.

Juniper-Hallett bounded down the steps. "Janet! Didn't Justin Lane-Walsh send you here?"

"Why no, Horace. I haven't heard from Justin since he was degraded. I came here because I thought Mr. Carey-West could tell me where you—"

"Oh my Service! Then Justin did double-cross me! Lord Archwin was right; I *am* an idiot. Now I'm in bad with the Crosleys, and Justin'll be here any minute with a gang of Strombergs!" He took the pistol from Janet and laid it on the table. He turned to Ryan and Duke-Holmquist. "I guess you birds can go; I don't see how I can do any good keeping you here."

The engineers grinned as if they

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had expected something of the sort all along. Duke-Holmquist said: "Why don't you throw in with us, young man? You can't expect anything from the companies, you know."

"I don't know . . . I don't know what you stand for—"

Duke-Holmquist opened his mouth to say something. Just then the door flew open, and four Strombergs with dueling sticks tumbled down the steps. In their lead was Justin Lane-Walsh.

LANE-WALSH pounced on the pistol. He turned to Juniper-Hallett, grinning nastily. "Hah, sister, so you're still here, huh? Very nice, ve-ery nice indeed. We'll take these smart engineers along. But first we'll teach you to marry a decent Stromberg girl."

Janet exploded. "You let him alone! He's my husband!"

"Exactly; that's just the point. But when we get through with him he won't be anybody's husband. Then maybe you can marry some decent Stromberg. Not me, of course," he added hastily.

Janet punched Justin Lane-Walsh in the nose.

Horace Juniper-Hallett kicked one of the Strombergs in the shin, violating Paragraph 9a, Section D, Rule 5 of the Convention. Then he wrenched the stick out of the man's hands, and hit him over the head with it.

The two engineers went into action likewise. Juniper-Hallett never could remember just what happened next. He did remember boosting Janet up the steps by main force, the engineers behind him, and slamming and locking the basement door just as the pistol roared and a bullet tore through the plastic.

"Mmgph," said a bundle of ropes on the floor. It was Miles Carey-West. They cut him loose. Another

bullet crashed through the door; they all ducked.

"What do we do now?" asked Juniper-Hallett.

The two engineers had been whispering. Duke-Holmquist said: "Follow me."

They sprinted out of the house. Carey-West panted after them, crying: "Can I come, too? I'm sunk anyway once it comes out that you used my house."

Duke-Holmquist nodded curtly and walked swiftly to Wilshire Boulevard. There he hailed a cab and piled his whole party into it. "The Dormouse Crypt," he told the driver.

"Where are we going?" asked Juniper-Hallett.

"Hawaii," said Duke-Holmquist.

"What?" Juniper-Hallett turned his puzzled frown to Ryan.

Ryan, instead of explaining how one got to Hawaii via the Crypt, said: "He's convinced finally that his strike plan's fallen through. We'll have to skip. You'd better come along."

Duke-Holmquist nodded gloomily. "If I'd had a couple more years to prepare—"

They zipped up the steep hill at the north end of Western Avenue.

Janet said: "But I'm not sure I want to go to Hawaii—"

"Sh, sweetheart," said Juniper-Hallett. "We're in this up to our necks, and we might as well stick with them." He turned to Ryan. "I can't understand why Lane-Walsh, if he was going to double-cross me, didn't do it last night while I was asleep and he had the gun."

Ryan shrugged. "He probably didn't make up his mind to do so until after he left Carey-West's house. He's not terribly bright, from what I hear."

They stopped and got out. Duke-

Holmquist told the driver to wait, and strode up to the front entrance of the Crypt. He whispered to the doorman.

The doorman stepped inside and shouted: "All visitors out, please! There's a time bomb in the Crypt, and it may go off any minute. All out, please! There's a time bomb, and these experts have come to take it away. All—"

He jumped aside as the first of the visitors to realize what he was saying went through the turnstile with his overcoat fluttering behind him. The others followed in record time. It did not take long, for it was still morning, and the Crypt was not yet full of visitors.

The engineers went straight to the movable casket, put their shoulders to it, and rolled it back. Juniper-Hallett and his bride followed them down into the underground room.

They did not take the time to pull the rope that slid the casket back over the hole. They went straight to a wall cupboard, opened it, and took out a simple electrical apparatus which Juniper-Hallett did not recognize.

A couple of wires led from the apparatus back into the cabinet. The apparatus had a brass arm with a circular pad on the end of it. Duke-Holmquist began depressing and releasing this arm, so that it went *tick-tick-tick, tick, tick-tick*, and so on. Juniper-Hallett was mystified. Then he remembered that one of the pioneers in electrical communication, centuries before, had invented a system of sending words over wires by having intermittent impulses represent the letters. The man's name had been—Morris? Marcy? No matter. Duke-Holmquist was sending a message of some kind.

And now and then he paused while the machine ticked back at him.

One of the Crypt guards put his head down the hole. "Mr. Duke-Holmquist, sir!" he said. "They've come!"

"The Strombergs?"

"Yes, sir. Automobiles full of them."

VIII.

DUKE-HOLMQUIST finished his ticking and stood up. He asked: "Have any of you boys guns?"

"No, sir. Toomey-Johnson, the night watchman, is the only one of us allowed to have one, and his was taken off him the other night."

The burly engineer cursed softly. Then he bounded up the steep steps. The others followed.

About fifteen Strombergs stood around the entrance, hefting their sticks. Their way was barred by three guards with billies. Justin Lane-Walsh, among them, yelled in: "You might as well send 'em out, or we'll come in and get 'em!"

Juniper-Hallett asked Duke-Holmquist: "What are the cops doing?"

"We don't want to call in the police, and neither do they." The engineer turned to the guard who had called them: "How about the rear entrance?"

"They got some men there, too, sir; all around."

"Looks as though we were stuck," said Duke-Holmquist somberly.

Juniper-Hallett fingered the stick he had taken from the Stromberg. "Our cab's still out there."

"Yes, but we haven't got a chance of getting to it."

"I don't know," said Juniper-Hallett. "I can run pretty fast."

"You've got an idea, Juniper-Hallett?"

"Yep. I'll draw 'em off, and you make a run for the cab."

"Horace!" said Janet. "You must not take such a risk—"

"That's all right, darling." He kissed her and trotted off to the rear entrance.

Two guards inside it faced three Strombergs outside. Juniper-Hallett pushed between the guards and leaped at the nearest Stromberg: *Whack! Whack!* The Stromberg dropped his stick with a howl. The others closed in on Juniper-Hallett; one of them landed a blow on his shoulder. Then Juniper-Hallett wasn't there any more. He dodged past them and raced around the big building over the smooth lawn. He hit one of the front-door Strombergs and kept on running, pausing just long enough to thumb his nose at the rest as they turned startled faces toward him.

Yapping like a pack of hounds, they streamed away after him. He ran down the long hill, breathing easily. This was fun. He could outrun the whole lot—

He took another glance back, and ran into a fire hydrant. He went sprawling, fiery pain shooting through his right leg. The yells rose as they pounded down to seize him.

The cab squealed to a stop just beside him. He had barely the strength and presence of mind to reach a hand up; a hand from the cab caught it and pulled him in. That is, it pulled him part way in; a Stromberg got a hand on his ankle.

"Ow!" yelled Juniper-Hallett.

The tug-of-war was decided by the cab driver, who spun his rheostat. Off they went. The would-be captor was dragged a few steps, and then let go.

"I think my leg's broken," said

Juniper-Hallett, Ryan felt the leg and decided it was just bruised.

Janet, looking out the rear window, said: "They're coming in their cars."

"Can't you go any faster?" Duke-Holmquist asked the driver.

"Governor's on," was the reply.

"Can't do over sixty k's."

"Damn," said Duke-Holmquist.

"What's that?" asked Ryan.

"Cars have governors nowadays?"

"Yes. They go on automatically when you enter a built-up area. But if we can't do over sixty, neither can they."

THEY PURRED sedately down Western Avenue at sixty kilometers per hour, and the Stromberg force purred after them. Now and then one party would gain when the other was held up by traffic. But on the whole they maintained the same interval.

Duke-Holmquist asked the driver: "When does it go off?"

"Slauson Avenue."

"When it does go off," said Juniper-Hallett, "they'll be able to catch us. They've got big, fast cars. Where are we headed for, anyway?"

"San Pedro," said Duke-Holmquist.

"Are we taking a seaplane?"

"No. The navy could catch us easily."

"Submarine?"

"No. There hasn't been time for the Hawaiians to send us one."

"What, then?"

"You'll see."

"But—" Just then they reached the southern limit of the governor zone, and Juniper-Hallett's question was choked off by the cab's spurt. The driver kept his hand on the horn button. They gained several blocks on the pursuers before the latter reached the edge of the zone and accelerated.

"They're gaining," said Janet.

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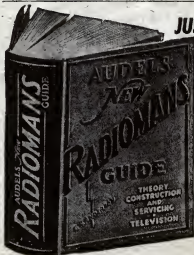
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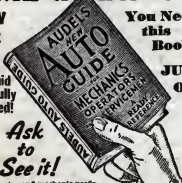
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"Oh, dear," said Carey-West. The little oldster was trembling.

They squealed around a corner and raced over to Main Street, then took another corner.

"They're still coming," said Janet.

A little while later she said:

"They're gaining again."

Duke-Holmquist and Ryan looked at each other. "Maybe we could figure the point where they'll catch us by differentials," said the former.

"Maybe," said Ryan, "we could tell 'em we're not us, but a family on its way to a polo game."

Juniper-Hallett looked to the right of the car into the open cut in which the Pacific Electric's inter-urban line ran. "Hey!" he said, "look down there!"

Half a mile ahead of them they could see the tapering stern of a car pulling into the North Compton station.

"Change to a streetcar?" said Duke-Holmquist.

"Right. Hey, driver!"

They skidded into the station. They were scrambling aboard a few seconds later when the Stromberg cars pulled up.

The streetcar was a thirty-meter torpedo that ran on two rails, one below it and the other overhead. The motorman's compartment was a closed-off section in the nose. The four men and the girl marched up to the front of the car, threw open the door, and crowded into the compartment. The legitimate passengers looked at one another. They had never seen that happen before. But then these people had seemed to know what they were doing, so they didn't feel called upon to interfere. The car started, a bit jerkily. It accelerated up to its normal two hundred kilometers per hour. It kept on accelerating. The passengers began to mutter and look to their safety belts.

Inside the compartment, the mo-

torman, who was being firmly sat upon by Duke-Holmquist and Ryan, protested: "You'll pass Gardena station! This is a local! You gotta stop at Gardena!"

"Hell with Gardena," said Juniper-Hallett over his shoulder. He was at the controls.

"How fast is she going?" asked Ryan.

"Three hundred and thirty-six k's."

"You'll burn out the fuel batteries!" wailed the motorman.

Juniper-Hallett said soothingly: "The P.E. can sue us, then. Say, maybe you'd better tell me how to stop this thing, motorman old sock!"

"What?" shrieked the motorman. "You don't even know?"

Somebody knocked on the door. The committee ignored the knock. Somebody tried the door, but they had locked it in advance.

The motorman told Juniper-Hallett how to stop the car. He also asked where they were.

"I'm not sure," said Juniper-Hallett, "everything goes by in such a blur. Matter of fact, I think we're near Anaheim Road."

"Then stop it! Stop it!" yelled the motorman. "Or we'll go right off the end of the track into the drink!"

"Oh, my!" said Carey-West.

JUNIPER-HALLETT applied the brake. The landscape continued to flash past; they had come out of the cut onto an embankment. Juniper-Hallett applied more brake. Wilmington rushed at them. The deceleration squashed them all against the front of the car. They were through Wilmington and screeching down the end of the line. The bumpers grew at them as the landscape finally slowed down. They hit the

bumpers with a bang, and tumbled backward.

They raced out through a ear full of jade-faced passengers. Duke-Holmquist led them a couple of blocks to the waterfront.

"Damaso!" yelled Duke-Holmquist.

A swarthy man stuck his face up over the edge of the nearest pier. "Hiya, boss!" he said.

"Everything ready?"

"Sure is, sir."

They tumbled breathlessly down steps and into an outboard boat. Before they had recovered their breath, Damaso had cast off and purred out to a dirty-white yawl anchored among a flock of motorboats, sailboats, and tuna clippers.

"Are we going in *that*?" gasped Juniper-Hallett.

"Uh-huh. Climb aboard."

"But you're crazy! They'll catch us in a police launch or something in ten minutes!"

"Do as you're told," snapped Duke-Holmquist.

Juniper-Hallett, half convinced that he was accompanying a party of lunatics, hopped aboard the yawl and helped Janet up. Damaso was already casting off from the buoy. The yawl had a little coke-gas auxiliary that sputtered into feeble life. Juniper-Hallett was sure the engineers were crazy; starting for Hawaii—with half the Stromberg Co., and the Los Angeles Harbor Police, not to mention the Imperial American Navy, likely to be after them any time—in a little cockleshell designed for taking people out for a day's fishing. The boat did stink of fish, at that, and the low afternoon sun glinted on a silvery scale here and there.

They vibrated out of the long channel with maddening slowness. Juniper-Hallett squeezed Janet's

hand until she complained he was hurting her.

"Take it easy," said Ryan. "Duke-Holmquist knows what he's doing."

"I hope he does," said Carey-West. "Oh, dear, why did I get mixed up in this?"

"Don't worry about the police," said Duke-Holmquist, his monocle reflecting the sun as he stood at the wheel. "Lieutenant More-Love is one of our sympathizers. The P.E. will try to set them after us, but he'll see that they look every place except the right one."

"How about the Strombergs?" asked Juniper-Hallett.

"I think one of those young nobles owns a seaplane. If they come after us, there may be trouble. We'll worry about that when the time comes."

THEY were out of the channel. In the outer harbor sat part of the navy: a seaplane mother ship, three hundred meters long, with five of her birds around her; flying boats with a one hundred and fifty-meter wingspread, each of which carried launches and dinghies larger than the fishing yawl.

Juniper-Hallett looked at Duke-Holmquist, jerked his thumb toward the flying boats, and raised his eyebrows.

Duke-Holmquist said: "I think the Strombergs will do everything they can to catch us themselves first, before they call in the Board of Control. If they take us, it probably won't be alive."

"You're the head of the Ayesmy, aren't you, sir?"

Duke-Holmquist permitted himself a wry smile. "You're right, youngster. Or I was until I had to run away."

They were rising and falling in the Pacific swells now. Juniper-Hallett said: "I wish they'd come if they're going to. I don't like this waiting."

"The longer the wait, the better our chances," said Ryan imperturbably.

Juniper-Hallett asked: "What was the Ayesmy up to?"

Duke-Holmquist replied: "We were going to pull a strike of all engineers, to have the compulsory contract system abolished. We were going to force a lot of other reforms, too, to break down the compartmentation of the Corporate State and give everybody a hand in the government. But it was terribly slow work operating by means of an illegal organization. If we tried to take in all the technicians, there'd bound to be a leak. And if we didn't, we couldn't count on the nonmembers when the time came."

"The truth is," said Ryan, "that they'd never have gotten sufficient co-operation from the profession anyway. Your average engineer is too much enamored of respectability and dignity to go in for revolutionary conspiracy. For the privilege of rating salutes from the white-collars, they'll put up with their state of gilded peonage indefinitely."

"That's not fair, Arnold," protested Duke-Holmquist. "You know those—"

"We've argued this before," said Ryan, "and we've never gotten anywhere. I say, isn't that our friends?" He pointed north at a silvery speck in the sky.

Janet said: "Justin kept his plane at Redondo Beach."

"That's what took them so long," said Duke-Holmquist. "Damaso! Get the things out." He grinned at the company, once again self-confi-

dent at the prospect of violent action. "Stand by to repel boarders!"

The seaplane grew, snored overhead, turned, and came down with a smack on the waves. It taxied up astern of the yawl.

As it approached, they could see Justin Lane-Walsh climbing out on the left wing. His mouth opened and moved, but they could not hear him against the wind and the whir of the propeller. The seaplane swung to one side and came up abreast of them to windward. The other Strombergs climbed out, too. Lane-Walsh yelled, this time audibly: "Heave to, you!"

Duke-Holmquist said: "Do you see that pistol anywhere?"

"No," said everybody after looking.

Ryan added: "Maybe they lost it, or emptied it breaking the lock of that door."

"Fine," said Duke-Holmquist. He put his hands to his mouth and bellowed: "Keep off or we'll sink you!"

"Haw haw," roared the Strombergs.

The yawl pounded ahead through the swells, and the breeze blew the seaplane astern of them again. The pilot gave the motor more juice, and the machine crept up alongside once more.

Duke-Holmquist called: "Let 'em have it, Damaso!"

DAMASO, standing on the forward deck with his feet spread, was doing a curious thing. He was whirling around his head a length of rope to the end of which was tied a block of wood. He gave a fast whirl and let fly. The block few toward the plane, the rope snaking after it.

The Strombergs saw it coming, and evidently thought those in the yawl were throwing them a rope to make fast. A couple braced them-

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selves and spread their hands as if to catch it. But such was not Damaso's intention. The block hit the propeller with a terrific clank; splinters flew; the propeller stopped turning with a jar that shook the seaplane. The propeller was seen to have one blade sharply bent, and to have meters of rope tangled around its hub.

The Strombergs set up a howl of rage. Some of them climbed out on the left wing as if ready to jump down into the yawl, toward which the wind was swiftly blowing them. The seaplane tipped alarmingly. The pilot yelled. A couple of Strombergs crawled out on the other wing to balance the craft.

Damaso hurried aft with a boat-hook.

Duke-Holmquist said: "Get ready to jab a hole in their float at the water line."

Damaso poised himself. The Strombergs, yelling threats, clustered at the end of the wing. At the tip was Justin Lane-Walsh.

For a breathless thirty seconds the parties glared at each other, as the two craft bobbed closer and closer. Duke-Holmquist spun the wheel a little, the yawl nosed downwind a few points.

"They're going to drift astern of us," said Juniper-Hallett.

Duke-Holmquist laughed shortly. "Don't you think I ever ran a boat before?"

The wind pressure on the seaplane's rudder had swung the craft into the wind like a weather vane, so that, though it was drifting astern of them, its left wing was still toward them. Justin Lane-Walsh gathered himself to jump; but they were not quite close enough.

"Hey," said Juniper-Hallett, "we need that bird!"

He snatched the boat-hook from Damaso and shot the business end up to the seaplane wing. He caught

the hook in Lane-Walsh's star-spangled pants and yanked. Lane-Walsh's legs went out from under him; he sat down on the wing tip, bounced, and smacked the water. A cloud of spray rose, and was instantly blown down against the receding seaplane.

Juniper-Hallett caught a glimpse of a head of copper-wire hair, but it was already out of reach of his hook. Duke-Holmquist nodded and brought the boat around in a big circle. They came upon Lane-Walsh, swimming heavily in his clothes toward the seaplane, which was drifting swiftly in the general direction of Ensenada. They hauled him aboard. The chatter of his teeth came clearly over the puttering of the engine. The Pacific off sunny southern California is icy in February.

Juniper-Hallett explained: "I just remembered that he was with me in the Crypt the night we made our raid, and recognized several of the Ayesmy members. He'd have made trouble for them if we'd left him here."

"Good work, boy," said Duke-Holmquist.

JUNIPER-HALLETT winced at the "boy." If being married didn't make one a full-grown man, entitled to the respect accorded to such, what did?

He asked: "Are we safe now, sir?"

"No," said Duke-Holmquist. "They'll radio their company, and the company will appeal to the Board of Control to order the navy out to stop us."

"Then it's useless to try to get away?"

"We'll see."

Ryan climbed out of the cabin, whither he and Damaso had taken Lane-Walsh to change his clothes.

Juniper-Hallett asked him: "How do you fit into this, sir?"

Ryan's smooth brown face smiled, and the wind ruffled his stiff gray hair. He said: "I was to be a go-between for the Ayesmy and the Hawaiians. The Hawaiians wanted to back the Ayesmy in upsetting the Corporate system, because it would end the seige of the Islands. But they wanted somebody they could trust, not having any agents on the mainland. I was the only one, and I was in a hibernine sleep.

"Then that Stromberg engineer discovered the effect of strontium bromide, and the Strombergs stole me from the Crypt to try to get the secret of the Hawaiians' power from me. It was developed back before I went to sleep, you know. Of course, the Stromberg engineers who were also Ayesmies knew about the theft, and arranged to have the Ayesmy rescue me."

"How did the Ayesmy communicate with the Hawaiians? I'd think their messages would be intercepted."

"They would have been, if they had been sent the normal way. But people used to communicate with the Islands, centuries ago, by under-sea cables, and those cables are still there. The mainland end of one of them is in a museum in Frisco. The Ayesmy spliced a lead into it and used the ancient dot-dash method."

"What is the Hawaiian power?"

"Maxwell demons, sir," said Arnold Ryan.

"What?"

"Special bacteria. Bacteria are the only things that can break the second law of thermodynamics, you know. They can, for instance, separate levulose from fructose, though the molecules of these sugars are

identical except that one is a mirror image of the other. Starting with these bacteria, the Hawaiians have developed strains that will build up hydrocarbons out of water and carbon dioxide, taking their energy directly from the heat of the solution. So the solution gets cold, and has to be brought back to outside temperatures to keep the reaction going. But they have the whole Pacific Ocean to warm it up with. It's like putting a lump of ice in a highball, and instead of the ice's melting, having the ice get colder and the highball hotter."

Juniper-Hallett did not understand much of this. He asked: "Then are all these plans for breaking the Corporate system finished?"

"Not quite. The Antarctic coal fields will run out in a couple of years, and we'll be able to dictate our own terms to the Empires. Meanwhile we'll sit in the sun in the Islands and take life easy. You'll like it, I think. We Hawaiians haven't such an elaborate code as the mainlanders, but we stick better to the one we have." He shaded his eyes. "That is, you'll like it if we get there alive. Here comes the navy now."

THEY ALL looked back toward the mainland. The air was full of a deep throbbing sound which grew to the roar of one of the giant flying boats.

The monster thundered past them, seeming to skim the waves, though it actually was a good thirty meters up. A gun cracked, and a 10.5-centimeter shell crashed in front of them.

"That means heave to," said Duke-Holmquist. His red face got redder and he shook a fist. He made no move to stop the boat.

The machine came back on the opposite side, between them and Santa Catalina Island. Another shell crashed, this time closer. It sent up a tall finger of water, which hung for an unreasonable time before collapsing.

Juniper-Hallett asked: "Will they try to board us?"

"Not if I know the navy," said Duke-Holmquist. "They'd like a little target practice on a live target."

The machine banked ponderously astern of them. This time, as it passed, it let loose a full broadside.

"Duck!" yelled Duke-Holmquist, doing so.

The air was suddenly full of noises like a train wreck and six shells hit all around them. Splinters whined overhead; a couple crashed through the yawl's planking; one of the columns of water toppled onto their deck, drenching them.

The yawl staggered, but kept on. The next time, Juniper-Hallett thought, they'll blow us to pieces. He hugged Janet, and heard Ryan's voice in his ear: "Sorry we got you kids into this—didn't have time to warn you—"

The navy ship thundered past again. Juniper-Hallett held his breath. It was coming—

Their engine stopped with a wheeze. Duke-Holmquist bounded to his feet with an inhuman scream. "They did it!" he yelled, dancing and waving his big fists.

"Did what?" asked Juniper-Hallett. Then he realized that the rumble of the flying boat's propellers had ceased. The only sounds were those of wind and water. He looked over the lee gunwale to see the flying boat glide silently down to the surface and settle like a big duck

a kilometer or two away. He repeated: "Did what?"

"The Hawaiians got their thing that multiplies the terrestrial magnetic field turned on, so that there's a strip all along the coast that nothing can get through but a sailboat or rowboat. That's what I was wiring about from the Crypt. Now do you see why we started out in this little thing? Damaso! Damn it, comes out of that cabin; the war's over. Fix those holes in the wood-work. Arnold, do you know how to get the sails up? Here, boy, take the wheel while I'm helping Ryan."

THE DECK was now sharply canted to the brisk northeast breeze. The sun was half below the horizon ahead of them. When they crested a swell, a broad highway of golden reflection glared in their faces.

Horace Juniper-Hallett and his wife sat bundled in sweaters and things, their feet braced, watching for flying fish and ducking the cold spray. The navy flying boat was out of sight, even from the tops of the swells.

Janet gave up trying to wax her nose to the proper degree of shininess, and turned to Juniper-Hallett. She said. "Horace! I just remembered my cat! My little Dolores!"

"Dolores'll have a nice home—in the zoo."

She sighed. "I suppose so. Anyway we're alone at last, dearest."

Juniper-Hallett looked around the little yawl, which was very much occupied by its seven passengers. The cabin seemed to be half full of canned goods, and the other half full of a morose, blanket-wrapped Justin Lane-Walsh. Obviously everyone would be very much in everyone else's hair for many days.

"Not quite, sweetheart," Juniper-Hallett replied. "But we shall be. We shall be."

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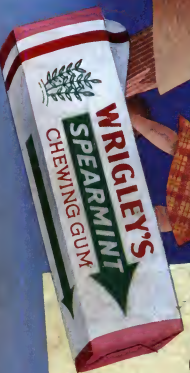
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